Chapter 12

# Technological Leadership

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**Abstract**

In today's world, leadership concepts are undergoing a fundamental transformation due to the impact of digitalization. In this context, technological leadership has evolved beyond an approach focused solely on the use of technological tools to become a leadership model containing multi-layered dimensions. This study examines the concept of technological leadership, which has come to the fore in our era of rapidly increasing digitalization, from a multidimensional perspective. The historical development process of technological leadership, its fundamental components, leadership styles, and skills have been comprehensively examined, with particular emphasis on its mutual interaction with digital transformation. Literature reviews indicate that technological leadership has a direct impact on organizational performance, innovation capacity, and digital adaptation. Furthermore, ethical responsibilities and social impacts in the context of integrating artificial intelligence and advanced technologies into leadership processes are also evaluated. The study also analyzes the structural, cultural, and ethical challenges faced by technological leadership and offers predictions for future leadership approaches. The study aims to contribute to academic and applied research, providing a theoretical framework for future studies.

## 1. Introduction

Technological developments in today's world are profoundly transforming the way organizations operate and societies live. Advances in areas such as digitalization, artificial intelligence, the Internet of Things, big data analytics, and automation are reshaping not only production processes but also management approaches (Kraus et al., 2021). This rapid change process necessitates a new form of leadership that goes beyond traditional leadership approaches. This leadership form is a technological leadership approach that

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not only views technology as a tool but also positions it as a strategic value creator (Avolio et al., 2014).

Technological leadership refers to leaders' ability to effectively use technology in decision-making and change management processes. In this context, leaders must not only possess technical knowledge and skills but also have the strategic vision to integrate technology into organizational goals. In this respect, technological leadership plays a critical role in enabling organizations to gain a sustainable competitive advantage in digital transformation processes (El Sawy et al., 2016).

Furthermore, the importance of technological leadership extends beyond economic outcomes. Its contributions are multidimensional and include promoting employee development within an innovative organizational culture, enhancing agility in business processes and focusing on socially beneficial areas of technology use. However, the ethical issues and cybersecurity threats that leaders face in a rapidly changing technological environment cannot be ignored. In this context, various studies on the ethical issues and cybersecurity threats that leaders encounter in a rapidly changing technological environment show that this topic is becoming increasingly critical.

- ***Ethical dilemmas and security dilemmas:*** Technological developments are confronting leaders with ethically challenging situations. Measures taken against cyber threats (e.g., data collection, encryption, anonymization) can harm certain fundamental values, thereby giving rise to ethical debates (Domingo-Ferrer et al., 2017).
- ***Legal gaps and lack of international cooperation:*** Existing national and international legal frameworks are inadequate in the face of rapidly evolving cyber threats, leading to blurred ethical boundaries. Therefore, ethical rules are becoming increasingly important, and leaders are expected to make decisions within the framework of these rules (Troshchenkov & Halona, 2024).
- ***The need for ethical leadership in cybersecurity:*** Business leaders need to adopt proactive security strategies that consider not only technological but also ethical, human, and managerial dimensions. These strategies should be supported by human behavior, education, and awareness (Balzano & Marzi, 2024).
- ***Artificial intelligence and ethical issues:*** While the use of artificial intelligence in cybersecurity provides rapid responses, it also raises serious ethical issues such as data privacy, impartiality, and

accountability. This necessitates that managers be equipped not only with technical but also ethical competence (Al-Mukhtar, 2024).

- ***Integration of ethics and emotional intelligence:*** It is argued that artificial intelligence and emotional intelligence should be used together to improve ethical decision-making processes. This contributes to leaders approaching ethical dilemmas in a more sensible and balanced manner (Abidin et al., 2025).

This study aims to examine the theoretical dimensions of the concept of technological leadership. The study will first discuss the historical development of the concept and its theoretical foundations in literature. It will then focus on the components of technological leadership, its functions in the organizational context, and its critical role in digital transformation processes (Elkirmis, 2025). Furthermore, the effects of technological leadership on employee performance, innovation, and sustainable competitive advantage will be evaluated, focusing on ethical responsibilities, social dimensions, and potential future contributions. Thus, the aim is not only to reveal the theoretical framework of technological leadership but also to provide an analysis of its applicability in different sectors.

## 2. The Concept of Technological Leadership

Technological leadership is a strategic leadership approach that goes beyond the use of technology and emerged in response to the pressures of transformation brought about by the digital age. This concept has gained increasing importance, particularly since the late 20th century, as technology has reshaped organizational structures and leadership roles. Technological leadership involves not only individuals or institutions keeping up with technological developments, but also the ability to guide, transform, and integrate these developments into strategic decisions (Daugherty et al., 2013).

The development of the concept was first observed in corporate contexts where technology-based management practices gained importance. Initially, technology-focused approaches used in businesses' R&D investments and product innovation processes eventually necessitated the integration of a technological dimension into the understanding of leadership. In this context, the concept of technological leadership is considered not only in terms of technical expertise but also in terms of vision, change management, and the ability to guide digital transformation processes (Sadowski & Roth, 1999).

Technological leadership essentially consists of components such as strategic vision development, integrating technology with corporate goals, knowledge-based decision-making, digital ethical awareness, and encouraging continuous learning. This type of leadership means more than just establishing and managing technological infrastructures. It also makes organizational culture open to innovation by increasing employees' digital literacy (Bezrukov et al., 2024). The concept has found wide application not only in the private sector but also in areas such as public administration and education (Samsudin & Ghani, 2020).

At the global level, states' technological leadership strategies guide strategic areas such as national sovereignty, digital security, and economic competitiveness. Countries that are pioneers in technology production and management use this leadership approach not only in their domestic policies but also as a power factor in international relations.

Today, technological leadership encompasses not only the management of existing technologies, but also the strategic integration of advanced technology areas such as artificial intelligence, big data, the Internet of Things and cybersecurity. Therefore, leaders must possess not only technical knowledge but also ethical sensitivity, decision-making skills that consider social impacts, and a vision for digital transformation (Al-Mukhtar, 2024).

## 3. Technological Leadership and Digital Transformation

Technological leadership plays a strategic role in the success of digital transformation processes. The concept of digital transformation refers to a multidimensional change that requires not only the renewal of technological infrastructure, but also the restructuring of organizational culture, business processes, and leadership approaches. Throughout this process, leaders go beyond effectively managing digital technologies and take on critical responsibilities such as creating a vision for transformation, involving stakeholders in the process, and overcoming organizational resistance (Mwita & Joanthan, 2020).

Research shows that for digital transformation to be successful, leaders must possess technological literacy, strategic foresight, and change management skills. The transformation process is directly impacted by leaders' ability to develop a digital vision, embrace data-driven decision-making processes and motivate employees in line with this vision. (Souza & Pietrafesa, 2023). Digital leadership also plays a decisive role in supporting organizational agility and innovation (Chauhan & Thangavelu, 2024).

The literature also emphasizes that digital leaders must possess not only technical knowledge but also human skills such as collaboration, transparency, and ethical sensitivity. In this context, the understanding of leadership is evolving away from traditional authoritarian models toward a more horizontal, participatory, and data-driven structure (Klein, 2020).

### 4. Technological Leadership Skills

Technological leadership requires a multifaceted skill set that goes beyond just using technology, it also involves the ability to strategically steer technology, adapt employees to digital change, and ensure the sustainable digital transformation of organizations. In this context, the key competencies that a technology leader must possess include strategic thinking, change management, digital literacy, communication skills, problem solving, ethical awareness, and innovation (Beedle & Wang, 2013).

Studies conducted on the education sector have revealed that school administrators' technological leadership competencies have a direct impact on student achievement and teacher satisfaction. Among these skills, technology integration, team management, and effective use of technological resources are particularly prominent (Indah et al., 2022). Similarly, research conducted in military and high-tech sectors emphasizes that, in addition to technical competence, the leader's commitment to the task, adaptability, and interdisciplinary communication skills are also critical (Bar-Gil, 2024).

Technological leaders are also expected to possess strong personal characteristics. These include self-discipline, accountability, vision development, and trust-building skills. To be successful in technology leadership, not only technical knowledge but also "soft skills" such as people management, emotional intelligence, and effective communication are required (Robertson, 2007).

In summary, technological leadership skills encompass a multidimensional set of competencies ranging from technical expertise to strategic management, communication, and ethical sensitivity. Developing these skills is essential for organizations to gain a competitive advantage in the digital age.

### 5. Styles of Technological Leadership

Technological leadership styles refer to the behavioral patterns and management approaches adopted by leaders in organizational transformation processes accelerated by digitalization. In this context, it is emphasized that technological leadership cannot be explained by a single model, and that flexible and multifaceted leadership styles that vary according to

different situations are effective (Thite, 2000). In literature, innovative, transformational, interactive, and agile leadership styles represent different orientations of technological leadership in this context.

### 5.1. Innovative Technological Leadership

Innovative technological leadership encompasses not only the ability to manage existing digital tools, but also the competence to foster a strategic vision, the courage to take risks, and a learning organization culture that will drive transformation at the organizational level. Research shows that technological leadership plays a critical role in increasing innovation.

For example, a study conducted in the education sector showed that technological leadership and information and communication technology literacy significantly increased teachers' innovative behaviors (Dasmo et al., 2025). Similarly, it has been emphasized that innovative leadership is decisive in organizations' adaptation to technological changes in the age of digital transformation (Sunarmo et al., 2023). This leadership style offers advantages such as making employees open to innovation, creating technology-focused learning environments, and turning change into opportunity.

Especially today, with the rapid proliferation of technologies such as artificial intelligence, automation, and data analytics, innovative leaders must possess not only technological knowledge but also social and ethical leadership skills that can transform organizational culture. In this context, innovative technological leadership has become a strategic necessity for institutions seeking to gain a sustainable competitive advantage.

### 5.2. Transformational Leadership

Transformational leadership supports digital innovation by increasing employee motivation and making organizational culture open to innovation (Dupont et al., 2024). This leadership style stands out with its fundamental elements of vision creation, inspiration, sensitivity to individual differences, and intellectual stimulation. Transformational leaders demonstrate a high level of passion and self-confidence, engaging employees in their vision and motivating them to go beyond the set goals.

Research shows that transformational leadership has positive effects on innovation, performance, employee commitment, and job satisfaction. On the other hand, for this approach to be effective, the leader must be consistent in their words and actions, adhere to ethical principles, and build trust over the long term.

### 5.3. Interactive Leadership

Interactive leadership stands out with short-term goal management based on reward and punishment mechanisms; it is more effective in technical tasks and operational processes (Thite, 2000). In this leadership style, leaders tend to encourage employee performance with rewards while applying penalties for non-compliance with established standards. In this regard, it focuses on short-term goals, prioritizes stability, and exhibits a relatively more conservative stance in the face of change.

However, in today's digitalized work environments, where skills such as flexibility, creativity, and continuous learning have gained importance, it is emphasized that leadership models based solely on reward and punishment systems may be insufficient. An overly interactive leadership approach can hinder innovation and long-term development.

### 5.4. Agile Leadership

Agile leadership, one of the new generation leadership approaches, stands out with its decision-making flexibility, team-based work, and adaptability in rapidly changing technological environments (Bekiris, 2023). Agile leaders support their employees with horizontal organizational structures that encourage collaboration, individual development, and open communication instead of hierarchical control.

Research shows that agile leadership is not only a leadership style but also a strategic change tool that enables organizational culture transformation. Agile leadership, especially in digital transformation processes, increases decision-making speed, encourages innovation, and strengthens employee engagement (Ncube et al., 2024). This leadership style plays a significant role in creating a sustainable competitive advantage, enabling organizations to secure their long-term success. The literature emphasizes that this leadership style promotes organizational flexibility, effectively manages change processes, and prioritizes a people-centered management approach. Thus, leadership supports the sustainability of competitive advantage not only through technological or structural transformations but also by strengthening employee participation, motivation, and organizational engagement.

## 6. Ethics and Social Responsibility in Technological Leadership

Technological leadership is not limited to guiding technological decision-making processes, it also encompasses an inclusive sense of responsibility that considers the social, environmental, and ethical impacts of these

decisions. Rapidly developing technologies, such as artificial intelligence, bring leaders' ethical responsibilities to the forefront. This is because AI's decision-making mechanisms involve many ethical dilemmas, such as bias, privacy, accountability, and social equality (Jonas, 2014).

In this context, ethical leadership should be supported not only by individual values but also by corporate social responsibility (CSR) practices. Research shows that ethical leadership is positively related to CSR and that leaders who exhibit ethical behavior can make their organizations more responsible and sustainable. Particularly in sectors where AI-supported decision support systems are used, structuring these technologies in accordance with the principles of transparency and accountability falls within the ethical responsibility of leaders (Salazar et al., 2024).

With the integration of artificial intelligence technologies into social life, the scope of ethical responsibility is no longer limited to technical applications but encompasses much broader social dimensions. In this context, technological leaders should not only focus on internal goals such as organizational efficiency or competitive advantage but also consider the impact of these technologies on individual rights, social justice, and ethical principles. Issues such as the transparency of algorithmic decision-making processes, the protection of data privacy, the reduction of risks of discrimination based on artificial intelligence, and the preservation of human dignity are among the fundamental ethical priorities of technological leadership (Jonas, 2014).

In summary, the ethical and social responsibility dimension of technological leadership has become even more critical, especially with technologies such as artificial intelligence that can have powerful and unpredictable effects. In light of the need for a sustainable and fair digital future, it has become imperative for leaders to manage technology and guide society in accordance with ethical principles.

## 7. Organizational Outcomes of Technological Leadership

Technological leadership covers not only the integration of digital tools into managerial processes, but also the direct and indirect effects of this process on organizational performance. Research shows that combining transformational leadership style with technological adaptation increases organizations' overall efficiency, employee motivation, and innovation capacity (Saptono et al., 2024). In this context, technological leadership contributes not only to operational improvement but also to abstract

outcomes such as organizational flexibility, adaptability to change, and strategic vision development.

Innovation and competitive advantage are also among the organizational outcomes of technological leadership. An effective technology leader helps organizations successfully navigate their digital transformation processes and achieve a leading position in the market through visionary thinking, change management, and strategic alignment (Dey, 2022). This leadership style also enhances organizational learning and adaptation capabilities by encouraging the development of digital competencies among employees.

On the other hand, aligning the organizational structure with technology and leaders' strategic decision-making skills in this process are also critical. Especially in the post-COVID-19 period, the technological leadership approach has been seen to facilitate adaptation to new norms such as remote working, agile management, and digital service delivery (Obuba, 2022).

In summary, technological leadership provides holistic organizational development by transforming not only the technical competencies of organizations but also their fundamental elements such as human resources, strategic orientation, and innovation capacity.

## 8. Challenges in Technological Leadership

Technological leadership, while strategically important due to its capacity to guide digital transformation processes, faces numerous complex challenges. First, technology is evolving rapidly, and keeping pace with this pace of change requires leaders to have both technical knowledge and a willingness to continuously learn. Leaders must also contend with structural problems such as organizational resistance to change, inadequate infrastructure, budget constraints, and a lack of skilled human resources (Sincar, 2013).

Furthermore, technological leadership is intertwined not only with technical competence but also with emotional, ethical, and cultural dimensions. For example, when integrating advanced technologies such as artificial intelligence into organizations, leaders must also manage employees' emotional responses, ethical concerns, and cultural adaptation. In this context, leaders are responsible for addressing fear and distrust of technology, while also accurately communicating its benefits (Kakabadse et al., 2008).

Another significant challenge in leadership is technological uncertainty. It is difficult to decide which technologies will provide long-term benefits and which will be temporary trends. Making strategic decisions in this uncertain

environment challenges risk management and visionary skills (Kovalchuk et al., 2022).

In addition, for technological leadership to be effective across the organization, not only top-level managers but also all stakeholders must embrace this vision. However, due to lack of training, communication gaps, and strategic misalignments, this often proves to be a challenging process (Gulpan & Baja, 2020).

## 9. The Future of Technological Leadership

The future of technological leadership points to an era in which the need for leaders who can strategically steer advanced technologies such as artificial intelligence, automation, the Internet of Things (IoT), and data analytics—rather than merely managing digital tools—is rapidly increasing. With the Fourth Industrial Revolution, leaders must not only use technology but also manage the transformation it creates, acting with ethical and social responsibility (Groscurth, 2018).

The most important qualities expected of future leaders include digital intelligence, flexibility in decision-making in variable environments, data-driven strategic planning, and cross-cultural digital communication skills. Leaders are now moving towards managing agile, horizontal, and inclusive organizations rather than classic hierarchical structures (Taylor et al., 2019). At the same time, it is emphasized that in an environment of increasing technological uncertainty, visionary leadership must be combined with operational leadership that can keep pace with rapid change (Kovalchuk et al., 2020).

However, in an era where artificial intelligence and automation are transforming the workforce, it is inevitable that leaders develop not only technical competence but also ethical guidance and human-centered approaches. Leadership models are now being reshaped by concepts such as digital humanism, a passion for sustainability, multicultural collaborations, and flexibility (Toader, 2024).

The future of technological leadership will be shaped by leaders who not only understand technology but also transform it to deliver social benefit and corporate sustainability. This leadership approach necessitates a visionary, inclusive, and ethically grounded perspective capable of managing both the opportunities and risks of the digital age.

## 10. Conclusion and Recommendations

This study aims to explain how leadership has evolved in line with the requirements of the digital age by addressing the concept of technological leadership within a multidimensional framework. Technological leadership encompasses not only the use of digital tools but also complex processes such as creating strategic vision, managing organizational transformation, developing employees' digital competencies, and fulfilling ethical responsibilities. Emerging technologies such as artificial intelligence, the Internet of Things, and big data have necessitated a redefinition of leadership in both technical and human dimensions. In this context, technological leadership emerges as a holistic approach that responds to the leadership needs of the era.

An effective technology leader not only guides the use of technology but also transforms corporate culture, prepares employees for digital change, and develops an ethics-based management approach. Different styles of technological leadership, such as transformational, agile and visionary leadership, are effective to varying degrees in different contexts. Leaders who can flexibly blend these styles gain a strategic advantage. However, leaders also face many challenges, such as rapid technological change, digital inequality, algorithmic bias, data privacy, and organizational resistance.

In this context, the academic contribution of this study is to provide conceptual coherence regarding technological leadership and to systematically bring together information scattered throughout the literature. At the practical level, this study serves as a strategic guide for individuals in leadership positions. It clearly outlines the skills technological leaders should possess, the leadership styles that are effective in specific situations, and the ethical responsibilities they bear.

Several recommendations can be made for future research. First, empirical studies are needed to reveal how technological leadership is implemented in different sectors (education, healthcare, public, private). Furthermore, the role of leadership in AI-supported decision-making processes, employee perceptions, and their impact on organizational outcomes should be examined in detail. The effects of cultural context on leadership approaches should also be evaluated through comparative studies. Finally, in a world where digitalization is rapidly advancing, ethical and sustainable technological leadership models should be developed to shape the digital future and create leadership profiles.

## References

Abidin, A., Ariffin, N., Nasruddin, Z., Habidin, N., & Yusoff, M. (2025). Evaluating and Modelling Artificial Intelligence and Emotional Intelligence to Improve Cybersecurity Employee Ethical Competence Model. Journal of Advanced Research Design. https://doi.org/10.37934/ard.130.1.1325.

Al-Mukhtar, W. (2024). AI in Cybersecurity: Transformative Approaches to Safeguarding Information Technology Systems. Turkish Journal of Computer and Mathematics Education (TURCOMAT). https://doi.org/10.61841/turcomat.v15i3.14945.

Avolio, B. J., Sosik, J. J., Kahai, S. S., & Baker, B. (2014). E-leadership: Re-examining transformations in leadership source and transmission. The Leadership Quarterly, 25(1), 105-131.

Balzano, M., & Marzi, G. (2024). At the Cybersecurity Frontier: Key Strategies and Persistent Challenges for Business Leaders. Strategic Change. https://doi.org/10.1002/jsc.2622.

Bar-Gil, O. (2024). Characterizing Excellence: Lessons From Awarded Military-Technological Leaders. Armed Forces & Society. https://doi.org/10.1177/0095327x241259710.

Beedle, J., & Wang, S. (2013). Roles of a Technology Leader. , 228-241. https://doi.org/10.4018/978-1-4666-2656-0.CH013.

Bekiris, M. (2023). New Era and Leadership Styles. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4638056.

Bezrukov, A., Baydarov, D., & Faikov, D. (2024). State Technological Leadership: Conceptual Understanding and Formation Mechanisms. Economic Revival of Russia. https://doi.org/10.37930/1990-9780-2024-1-79-75-89.

Chauhan, R., & Thangavelu, C. (2024). Transforming Leadership for the Digital Era: Embracing Collaboration and Technological Proficiency. Educational Administration: Theory and Practice. https://doi.org/10.53555/kuey.v30i6.6033.

Dasmo, D., Notosudjono, D., & Wati, S. (2025). Technological leadership and ICT literacy as keys to increasing innovative teacher behavior. Jurnal Eduscience, 12(1), 25-36.

Daugherty, J., Mentzer, N., Lybrook, D., & Little-Wiles, J. (2013). Philosophical Perspectives on Technology Leadership. , 42-56. https://doi.org/10.4018/978-1-4666-2656-0.CH003.

De Moura Souza, E., & Pietrafesa, P. (2023). Leadership and Digital Transformation. Journal of Business Administration Research. https://doi.org/10.5430/jbar.v12n2p9.

Dey, A. (2022). Technology Leadership: Catalyst for Organizational Success. Journal of Economics & Management Research, 3(4), 1-3.

Domingo-Ferrer, J., Blanco, A., Arnau, J., Herrmann, D., Kirichenko, A., Sullivan, S., Patel, A., Bangerter, E., & Inversini, R. (2017). Canvas White Paper 4 – Technological Challenges in Cybersecurity. Social Science Research Network. https://doi.org/10.2139/SSRN.3091942.

Elkırmış, Ö. (2025). Stratejik Yönetim Kapsamında Sosyal Hizmet: Kavramsal Bir İnceleme. *Uluslararası Akademik Birikim Dergisi*, *8*(3).

El Sawy, O. A., Kræmmergaard, P., Amsinck, H., & Vinther, A. L. (2020). How LEGO built the foundations and enterprise capabilities for digital leadership. In Strategic information management (pp. 174-201). Routledge.

Gulpan, J. O., & Baja, R. M. (2020). Technological leadership of 21 st century principals of private secondary schools. International Journal of Advanced Research and Publications, 4(4), 66-69.

Groscurth, C. R. (2018). Future-ready leadership: Strategies for the fourth industrial revolution. Bloomsbury Publishing USA.

Indah, D., Bangkara, B., Sari, M., Mufidah, Z., & Fatmawati, E. (2022). Technological leadership systems and principal skills at the primary level. International journal of health sciences. https://doi.org/10.53730/ijhs.v6ns6.12523.

Jonas, H. (2014). Technology and Responsibility: Reflections on the New Tasks of Ethics. , 37-47. https://doi.org/10.1057/9781137349088_3.

Kakabadse, N. K., Lee-Davies, L., & Kakabadse, A. (2008). Smart technology: the leadership challenge. Strategic Change, 17(7-8), 235-249.

Klein, M. (2020). LEADERSHIP CHARACTERISTICS IN THE ERA OF DIGITAL TRANSFORMATION. Business and Management Studies: An International Journal, 8, 883-902. https://doi.org/10.15295/bmij.v8i1.1441.

Kovalchuk, J. A., Valinurova, L. S., Telegina, M. Y., & Stepnov, I. M. (2020). Digital Leadership in an Uncertain Technological Environment. In International Scientific and Practical Conference (pp. 114-122). Cham: Springer International Publishing.

Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. International journal of information management, 63, 102466.

Mwita, M., & Joanthan, J. (2020). Digital Leadership for Digital Transformation.

Ncube, L., Mahlangu, S., Kamango, K., Ncube, N. M., Moyo, M., Phiri, T., & Nemashakwe, P. The Role of Agile Leadership in the Success of a Contemporary Organisation: A Conceptual.

Obuba, M. O. (2022). Leadership strategy and organizational outcomes: a review of literature. Open Journal of Leadership, 11(2), 111-139.

Robertson, J. (2007). Attributes of Technology Leaders. https://doi.org/10.18260/1-2--1780.

Sadowski, M., & Roth, A. (1999). Technology Leadership Can Pay Off. Research-technology Management, 42, 32-33. https://doi.org/10.1080/08956308.1999.11671315.

Saptono, A., & Effendi, M. S. (2024). The Impact of Transformational Leadership and Technological Adaptation on Organizational Performance. Pakistan Journal of Life & Social Sciences, 22(2).

Salazar, J. A. Á., Palmeth, L. H. M., & Marín, J. G. A. (2024). Social Responsibility of the Engineer grounded in the Critical Theory of Technology. International Journal, 5(11), 6089-6100.

Sincar, M. (2013). Challenges school principals facing in the context of technology leadership. Educational Sciences: Theory and Practice, 13(2), 1273-1284.

Sunarmo, S., Rini, P., Nurdiana, D., Albart, N., & Hasanah, S. (2023). The Importance of Innovative Leadership in Improving Organisational Readiness for Technology Disruption. Jurnal Minfo Polgan, 12(1), 1427-1436.

Taylor, A., Santiago, F., Hauer, J., Hynes, R., & Mickahail, B. K. (2019). Leadership, Growth, and the Future. In Effective and Creative Leadership in Diverse Workforces: Improving Organizational Performance and Culture in the Workplace (pp. 101-153). Cham: Springer International Publishing.

Thite, M. (2000). Leadership styles in information technology projects. International Journal of Project Management, 18, 235-241. https://doi.org/10.1016/S0263-7863(99)00021-6.

Troshchenkov, S., & Halona, I. (2024). International Security System In The Light Of Cyber Threats: Legal Issues And Prospects. Public Management and Policy. https://doi.org/10.70651/3041-2498/2024.1.07.

Toader, S. (2024). Acing leadership of the future: a proposed archetype. Available at SSRN 4840197.