

## ARTIFICIAL INTELLIGENCE AND ITS IMPACT ON LEADERS AND LEADERSHIP

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**Abstract:** *One of the effects of the ongoing digitalization process on the industrial environment is the significant increase in the amount of data generated, due to the growing networking of IT systems and the increasing use of cyber-physical systems. To process this massive amount of data and draw conclusions, companies are increasingly using Artificial Intelligence (AI) methods. The growing application and use of AI have a significant impact on socio-technical work systems. In particular, challenges and requirements for leaders and leadership can be identified. Therefore, leaders and leadership are essential for the successful implementation and use of AI. This, along with the dynamic development of AI, calls for further research on its impact on leaders and leadership in order to support companies with practice-based guidelines and recommendations. To develop these guidelines, a comprehensive analysis of existing literature was conducted, which will form the basis for the subsequent steps. The results of the literature analysis were grouped into four main clusters: Strategic Transformation Process, Qualifications and Competencies, Culture, and Human-AI Interaction. The results are presented in detail, and an outlook on the next steps in research and development will be provided*

**Keywords:** *artificial intelligence, leadership, strategic transformation process, human-AI interaction, qualifications and competencies.*

**DOI <https://doi.org/10.56082/annalsarscimilit.2025.1.131>**

The field of research on Artificial Intelligence (AI) and the term itself cannot be clearly and uniformly defined. Therefore, it is not possible to provide an exact definition at this moment. This is due to the varied influences of technology. AI combines elements from engineering and cognitive sciences, which is evident in its diverse applications. Depending on the domain of use, different scientific disciplines are more required. For instance, speech recognition systems require detailed knowledge from neuroscience. In general, AI is considered a distinct research field within computer science. Therefore, it is necessary to establish a clear classification. AI can be divided into several levels of development, distinguished between Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and Artificial Super Intelligence (ASI). Currently, industrial applications only use Artificial Narrow Intelligence, which does not exceed the capabilities of Human Intelligence. Therefore, the application areas of Artificial Narrow Intelligence are very specific.

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In the first domain, Artificial Intelligence brings a change in the responsibilities of leaders as AI develops rapidly and expands its applications into specific domains. Leaders need to adapt to new technologies and understand how these influence decision-making and organizational processes. Leaders must be capable of integrating AI into their business strategies and processes, while maintaining a balance between innovation and managing the ethical and human challenges associated with AI implementation.

In the second domain, given the complexity and diversity of AI applications, leaders must acquire technical competencies and have a deep understanding of how AI can support business processes. This requires the development of adaptive leadership skills, capable of responding to rapid changes and challenges generated by the integration of new technologies. Leadership must evolve to support the responsible and efficient use of AI within the organization.

### **The Strategic Transformation Process**

The implementation and use of Artificial Intelligence in organizations require a detailed analysis of the strategic aspects. A key element in this transformation process is how the transition process is structured. The first step should be for leaders to realize that this strategic change process represents a long-term challenge. It is essential for leaders to have a common understanding of AI. Furthermore, it is necessary to set a clear goal that defines how AI will be applied in the future.

Setting and clarifying the goal are fundamental factors in the strategic transformation process. To support this effort, a well-defined vision can be used as a starting point. The vision provides direction and becomes the basis for the strategic implementation of change. At the same time, effective communication regarding planned changes is crucial. Leaders are responsible for conveying and clarifying the vision and strategy.

The active involvement of relevant stakeholders in the change process and maintaining transparency are other important factors for its success. These elements complement the factors already mentioned. All relevant actors must actively participate in the change. Stakeholders may include employees, but also their representatives. By involving them, their concerns and observations can be integrated into the transformation process from the early stages. This will contribute to ensuring transparency throughout the process. For these actors, it is important that the vision and objectives of the change are clear and well understood. Additionally, they must understand their role in the change process and how they can contribute.

First, it is essential for leaders to realize that the strategic transformation process related to the implementation of Artificial

Intelligence is not a quick undertaking but a long-term challenge. They must have a clear vision and a common understanding of the technology to define specific goals and guide the organization in a strategic direction. Without such a common vision, AI implementation can become fragmented and difficult to integrate into the company's operational framework.

Second, open and effective communication of the vision and change strategy is crucial to the success of the transformation process. Leaders must be able to clearly explain the purpose and steps the company needs to follow, ensuring that all employees and stakeholders understand the objectives and their importance. Active involvement through transparency and ongoing dialogue will create a climate of trust and support the successful implementation of AI in the company.

Third, the involvement of all stakeholders, including employees and their representatives, is an essential factor in the change process. By including them from the early stages of transformation, leaders can identify and address their concerns, thus facilitating a smoother and more transparent process. This active participation contributes not only to clarifying the vision and change objectives but also to creating an environment where all involved feel they have an important role in the success of the transformation.

### **Qualifications and Competencies**

Artificial Intelligence, with its capabilities, will have a significant impact on the development and refinement of the competencies required by leaders. An important aspect is that AI has the ability to draw conclusions and make decisions autonomously, which will allow technology to take over various tasks from leaders as time passes. As a result, there will be a redistribution of responsibilities between leaders and AI, and the requirements for leaders and their competencies will undergo significant transformations.

Changes will affect both professional and methodological competencies, as well as personal and social competencies. Regarding the implementation and use of AI, leaders do not need to possess detailed technical knowledge about the technology, but only basic notions about how it works. More importantly, leaders must have knowledge about the quality of data and how to manage it efficiently. It is also essential for them to understand the entire process in order to assess the risks of their decisions. As processes become more interconnected, the impact of their decisions increases.

Methodological and personal competencies are becoming increasingly important for leaders as well. They must be capable of coordinating the change process within the organization and managing its complexity. Their skills to navigate and facilitate change will become a central aspect of their work. Social competencies of leaders are also a

crucial category. With the introduction of AI, leaders will need to interact more and more with employees and AI.

Both employees and AI have individual characteristics that leaders must consider. Therefore, leaders will become responsible for designing the interaction and relationships between employees and AI. Together with employees, leaders will need to outline their roles in relation to AI, and employees must clearly understand their importance in this process.

It has been demonstrated that Artificial Intelligence introduces an additional component in the leadership process. As a result, the tasks of leaders will undergo changes. This becomes evident in how the interaction is modeled. Leaders must take responsibility for facilitating the interaction between employees and AI, which creates new requirements for them. Leaders must determine which activities will be taken over by AI and which will remain the responsibility of employees. In this context, it is essential for leaders to understand the strengths of each party involved and use them correctly. The ultimate goal must be to improve the company's competitiveness through the use of AI. However, during the implementation process, the social characteristics of employees should not be neglected, as they contribute to increasing the organization's innovation capacity. Additionally, attention must be given to ethical aspects in this process. When using AI, fundamental ethical values must be respected, which can be grouped into three main categories: self-determination, justice, and the protection of privacy and personal identity. Moreover, when designing the interaction, other important criteria must be considered. In this regard, four fundamental aspects are recommended: ensuring the protection of the individual, reliability, and an efficient distribution of labor, as well as favorable working conditions that involve aspects such as communication, collaboration, and social inclusion. Regarding design, leaders and employees must collaborate. Employees can contribute significantly to this process with their experience.

First, the integration of Artificial Intelligence in organizations requires a fundamental shift in the way leaders exercise their role. They must take responsibility for shaping and managing the interaction between employees and AI technology, making clear decisions about which activities should be taken over by AI and which tasks remain the responsibility of humans. Leaders must understand the strengths of each party involved, use them efficiently, and support the transition to the use of technology without underestimating the importance of human values. This involves not only effective change management but also protecting and strengthening an innovative organizational culture that supports the long-term growth and success of the company.

Second, the use of AI in organizations must be guided by ethical principles that ensure the protection of employees' rights and transparency

in decision-making processes. It is essential for leaders to implement fundamental values such as self-determination, justice, and the protection of privacy, to ensure that the technology is used in a fair and responsible manner. Furthermore, it is important for the AI integration process to focus on creating working conditions that foster efficient collaboration and social inclusion. Such an environment will contribute to better communication between employees and AI, ensuring a harmonious integration of technology into the organizational structure and enhancing long-term performance.



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