

Abstract of PhD thesis “Digital leaders in the age of Industry 4.0. In search for the model of leadership under digital transformation.”

The digital revolution, characterized by the integration of advanced technologies, has brought about a paradigm shift in the functioning of modern enterprises. The volatile nature of the market in digital age necessitates incessant organizational adaptation and the expeditious implementation of digital transformation to attain a competitive edge. However, despite the longstanding existence of the Industry 4.0 concept, numerous companies encounter challenges in instigating its adoption. In the presented dissertation Industry 4.0 is understood as an ongoing digital transformation, not only regarding advancements of manufacturing processes and methods due to capabilities that digital technologies provide, but corresponding to the entire organization that is caused due to uninterrupted technology development that brings disruptive changes to a market environment and simultaneously impacting any other facets of the global economy, which in turns, constitute to the convergence of physical and digital worlds by the creation of digital ecosystems within organizations as well as across any stakeholders. As the Fourth Industrial Revolution advances and impacts all aspects of business operations, organizations must adopt technological advancements throughout their value chain encompassing the evolving role of people in digital transformation as well as emphasizing the need for leaders to adjust their leadership styles and skills to the digital environment. From this perspective, there is a lack of research directly related to leadership in the era of Industry 4.0 conditions to unleash its full digital potential in the entire organization. This still under-explored role of leadership in a digitized world is one of the main managerial challenges, creating a cognitive gap. Therefore, the **aim of the dissertation** was to construct a model of digital leadership in the era of Industry 4.0, which is most appropriate in the rapidly changing digital environment of the 21st century. To achieve this goal, digital leadership competencies were examined and leadership best practices were identified in this regard. **Four research questions** were posed, such as:

Q1: What are the characteristics of companies operating in Industry 4.0?

Q2: What are the key factors the strongest impact on implementation of the Industry 4.0 concept in companies? Which of them are the opportunities and which are barriers?

Q3: What traits and skills should digital leaders have?

Q4: What leadership styles are the best for leaders in modern and digitally advanced companies?

Own research was used to achieve the aim of the work and to determine the answers to the questions posed. Literature studies were supplemented with focus groups and surveys, and the results obtained from the individual stages of the research allowed to consistently build a model of leadership in the technological and digital era. It was noted that the most effective leadership style should depend on the level of digital maturity at both the organization and employees level, indicating that it is the leaders who should be able to build a digital culture in the entire organization. Thus, the leadership style in the era of digital transformation should be focused on the adaptation of breakthrough technologies, focusing on a long-term vision of the use of technology and encouraging data-driven decision making. It was recognized that the most important skills and characteristics of digital leaders include: visionary, networking, working with a virtual/remote team, continuous effective learning, self-awareness and self-regulation, persuasion, storytelling for efficient communication, quick decision-making, innovation, tolerance of uncertainty, dealing with breakthrough changes and personal qualities such as humility, commitment, curiosity and openness, logic and intelligence, as well as flexibility as the most important of the basic managerial skills.

The research results and the proposed model should help organizations and their leaders better understand the challenges and opportunities related to the ongoing digital transformation and equip them with the skills and knowledge needed to successfully navigate this complex landscape. By identifying specific skills that are necessary for digital leaders, the adopted model can help not only

diagnose the key characteristics and skills of digital leaders, but also serve the creation of training programs and talent development initiatives, which undoubtedly has practical value.

The work consists of **4 chapters**. The first discusses the essence of Industry 4.0 and digital transformation and their impact on the management of organizations, with particular emphasis on the human factor and the impact of ICT technology. The second chapter presents the evolution of leadership theory, the impact of digital transformation on leadership, and the characteristics and skills of digital leaders. The third chapter explains the research methodology, presents the results of focus groups and discusses the sample and the research tool used in further survey research. The fourth chapter presents the results of quantitative research in order to propose the final model of digital leadership for enterprises operating in the era of Industry 4.0. At the end, the research questions were answered, research limitations and directions for further scientific exploration were indicated.

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