

Digital Leadership Added Value in the Digital Smart Organizations

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Abstract

The present article explores, analyzes and synthesizes the main types of manifestation of digital leadership added value in the digital smart organizations. The article upholds the thesis that leadership in a digital environment requires the combination of the leader competence model with the organization's systems for planning, organizing and controlling business processes' activities and management. After bringing forward the major characteristics of the digital smart organizations, a conclusion is drawn in the article that the leaders of the future will need skills in three areas:

- strategic leadership;
- business entrepreneurship;
- digital technologies.

These three areas form leadership in a digital smart organization and enable it to develop as a highly technological entity, employing in an optimal way the capacities of the digital technologies.

The digital leadership skills lead to establishing an efficient business organization, which represents a network-based organizational structure, while the digital smart organization is defined as an economic entity operating in a digital environment and using cloud technologies, artificial intelligence and robotics, the Internet of things, virtual and augmented reality, large bulks of data, various additive types of production and smart planning systems, process organization and control.

By reviewing the digital leadership main skills there is the added value for a digital smart organization outlined, which also has its specificity and impact on the characteristics of digital leadership.

Keywords: digital leadership, digital smart organization, added value.

1. Introduction

The historical overview of the definitions of "leadership" dates from the concept of Scottish writer, philosopher and historian Thomas Carlyle [1], who in 1840 formulated the so-called conception of the great man.

This concept is the first theory of leadership. According to her, leadership is an inherent quality characteristic of the individual and cannot be acquired in the course of human development and evolution.

The concept of leadership qualities [2] considers that the leader possesses fundamental qualities over time. It is through these qualities that the leader distinguishes himself from other people.

The concept of leadership participation [3] for the first time links the leader to the manifestation of a particular behavioral model, defined as a leadership style. According to this concept, leadership behavior influences efficiency, employee productivity and motivation.

The concept of charismatic leader [4] points out that only certain personalities possess exceptional qualities, personal vision and attractiveness that provoke support, following and recognition from others.

According to the concept of leadership behavior [5], a leader may, with his or her behavior, achieve a certain degree of employee satisfaction and a certain degree of effectiveness of the business organization itself.

In line with the concept of situational leadership [6], the effectiveness of the leader's behavior in the organization is directly related to the emergence of certain situations. Essential to leadership style in situational leadership is the magnitude of the various situational variables.

The concept of transactional leadership [7] considers that a leader should be perceived by employees as integrating respect, influence and authority.

The concept of transformational leadership [1] assumes that the influence of the leader on employees is related to their involvement in the development and determination of the future of the organization.

The attributive leader [8] interprets the behavior of employees according to the "signals" they send and according to the context of the particular situation. Thus, this leader forms his own leadership style.

The GRID leadership concept [9] defines a leader as two-dimensional - it integrates a focus on human resource satisfaction and a focus on achieving organizational performance.

Leadership is three-dimensional according to the German Synercube concept [10] - it links leadership style

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with result orientation, organizational culture and human resources.

The concept of Smart Leadership defines a leader as six-dimensional [11]. In accordance with this theoretical framework, the leader:

- ✓ has specific qualities;
- ✓ the results it achieves are measurable;
- ✓ its actions are consistent with the strategic goals of the organization;
- ✓ realistically assesses the environment in which it operates;
- ✓ always is limited in time.

In accordance with this concept, leadership is demonstrated from the external environment to the internal. The factors that determine a leader's style are:

- ✓ focus on result;
- ✓ focus on human resources;
- ✓ focus on organizational culture;
- ✓ focus on external environment parameters;
- ✓ focus on environmental variables;
- ✓ focus on identifying the leader with the organization.

Digital leadership [12] is a concept leading to a higher added value for the organizational system, to integrated full use of information and communication technologies, tools and human resources in the digital environment in order to achieve strategic orientation goals of a particular business system through team collaboration between people working through networked computers or mobile devices, achieved through the application of a specific style of leadership in a virtual environment.

Following this review of the development of conceptions for the leader, the following basic characteristics of the leader can be summarized:

- ✓ the leader influences the views and activities of the human resources through his personal characteristics or through his behavior;
- ✓ the leader creates prerequisites for team collaboration and manages teamwork;
- ✓ the leader focuses his / her efforts and the potential of the team on achieving a certain organizational goal;
- ✓ the leader has a long-term orientation on achieving the strategic guidelines of the organization.

In view of the accuracy of the analysis and synthesis of the definition of the added value of digital leadership in digital smart organizations, a brief overview of the concepts that largely define the concept of digital leadership should be given.

Such concepts are [12]:

- ✓ digital economy - a collection of related digital technology solutions, leading to automation, integration and real-time data exchange in manufacturing processes, and from there to added value (economic and / or social), many times higher than the traditional economic system;
- ✓ digital business organization - an enterprise in every sector of the economy that, on the basis of digital technology solutions, improves its business and production processes as well as its intellectual resources and as a result generates added value (economic and / or social), many times higher than traditional operators.

The object of research in this article is digital leadership in a digital smart organization.

The subject of analysis is the added value that a digital smart organization generates as a result of the implementation of the digital leadership concept.

The purpose of the study is to synthesize the added value of digital leadership for an organization operating in a digital environment.

2. A model of basic digital leadership skills in digital smart organizations

The fourth industrial revolution is evolving at a rapid pace, leading to development of innovative and intelligent technologies, new technological breakthroughs, covering areas such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3D and 4D manufacturing, nanotechnology, biotechnology, photonics, quantum computing. This leads to unprecedented changes in the paradigm of economy, business and society, as well as a profound and long-term transformation of the whole conceptual doctrine of leadership and its instruments. For this radical change, leaders of the future working in the digital environment must have the skills to enable the long-term development of a high-tech economy. These skills should include both complex interdisciplinary competencies (teamwork, communication, planning, forecasting, project management, networking and platform architectures, critical thinking, programming, robotics, etc.), as well as competence in understanding and communicating with multiple cyber-physical systems across virtual and technical platforms, environments and networks.

According to the needs of the business organizations, the leaders of the future need skills in three areas [4]:

- ✓ strategic leadership;
- ✓ business entrepreneurship;
- ✓ digital technologies.

These three areas shape digital leadership and enable business organizations to thrive as high-tech structures that make the most of the digital opportunities.

The high-tech economy requires building leaders capable of working in a digital environment.

The research, analysis and synthesis of numerous theoretical studies and practical projects [13-15] allow the creation of a model of the basic skills that provide digital leadership in digital smart organizations (Figure 1).

The basis of digital leadership is the systemic interconnection and interdependence between the three functional areas - strategic leadership, business entrepreneurship and digital technologies. The relational relationship between these three spheres must exist in unity and lead to the synergistic behavior of the leader operating in the digital environment. At the same time, each of the three functional areas contains certain basic knowledge and skills that determine the scale and capacity of digital leadership. Strategic thinking aims to manage interdisciplinary, international teams, and focuses on the direct impact and influence on employees, customers, suppliers, investors, shareholders, the public. It is directly dependent on the availability of knowledge in:

- ✓ management;
- ✓ controlling;

- ✓ finance;
- ✓ marketing;
- ✓ logistics;
- ✓ organizational structure;
- ✓ communication.

At the same time, strategic leadership is a consequence of the leader's ability for:

- ✓ collecting information;
- ✓ analyzing information;
- ✓ planning;
- ✓ forecasting;
- ✓ generating strategic alternatives;
- ✓ searching for and finding optimal solutions
- ✓ creativity;
- ✓ verbal and nonverbal communication;
- ✓ managing teams;
- ✓ motivation of human resources;
- ✓ control.

- ✓ implementation of flexible methodology.

A leader's digital competence is linked to a vision for synergistic, cutting-edge, high-tech results achieved through innovation and scientific development. This requires knowledge in:

- ✓ big data sets and tools for analyzing them; information technology tools;
- ✓ complex business systems;
- ✓ cyber-physical systems;
- ✓ artificial Intelligence;
- ✓ information technology architectures;
- ✓ platform architectures;
- ✓ internet of things;
- ✓ cloud technologies.

The skills characterizing the competence of a leader working in a digital environment, in the functional area "digital technologies" requires abilities for:

- ✓ analysis of large data sets;
- ✓ work in a blockchain network;
- ✓ virtualization;
- ✓ creation and development of mobile applications;
- ✓ creation and development of web pages;
- ✓ creation and development of IT architectures and platforms;
- ✓ ensuring cybersecurity;
- ✓ work with social media.

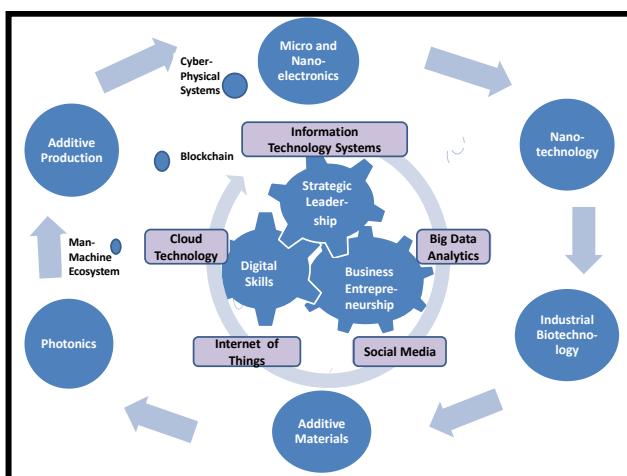


Fig 1. Model of skills for digital leadership in the digital smart organizations author's adaptation

As a functional area that determines the effectiveness of the digital leader, strategic leadership must be based on clearly defined cultural, moral and ethical values and models.

Business entrepreneurship is aimed at generating innovative operating and production business models, through which higher added value is realized. As a functional area of digital leadership, "business entrepreneurship" integrates knowledge about:

- ✓ market and its principles;
- ✓ marketing strategies;
- ✓ business analyses;
- ✓ innovation;
- ✓ investment.

The competences that accompany the "entrepreneurial spirit" are related to:

- ✓ building and maintaining customer relationships;
- ✓ realization of sales;
- ✓ establishing partnerships;
- ✓ project management;
- ✓ process optimization;
- ✓ analyzing the environment, processes and operations;
- ✓ financial management;

3. Research, analysis and synthesis of the digital leadership added value in the digital smart organizations

The development of the technologies and innovations, the artificial intellect and its transformation into an inseparable part of the economy, the production of new "intelligent" materials, machines and technologies, leading globally to the need for a new type of specialists, a new type of personnel and a new type managers. The challenge is to manage not only the digital processes, but also to integrate into the management the optimum efficiency of human resources that operate in the digital space from different spatial-geographical points. The complexity of processes, which gradually develop and move from the ecosystem "human-machine" into a blockchain network, and from a blockchain network to a cyberphysical system (fig. 1), requires the search for a new type of leaders who have a knowledge and competencies, allowing them to work in a digital environment, while managing machines, technologies, systems, processes and people. Thus, the economic reality gradually determines the search by the business organizations of digital leaders, who would contribute to obtaining added value of a new type.

In defining the term digital leadership, the term digital environment, most commonly referred to in the literature - a virtual, simulated space created using one or more computers or mobile devices, should be used as a foundation.

Said definition has two cumulatively inherent elements:

- ✓ virtual space;
- ✓ one computer or mobile device, or a network of computers or mobile devices.

The analysis therefore shows that the digital leader must:

- ✓ to work in the virtual space where the simulation of processes, phenomena and operations is a tool for forecasting, analysis and evaluation;
- ✓ to plan, organize, coordinate and control the operation of one or more computers or mobile devices;
- ✓ to motivate the human resources that provide the work of these computers or mobile devices.

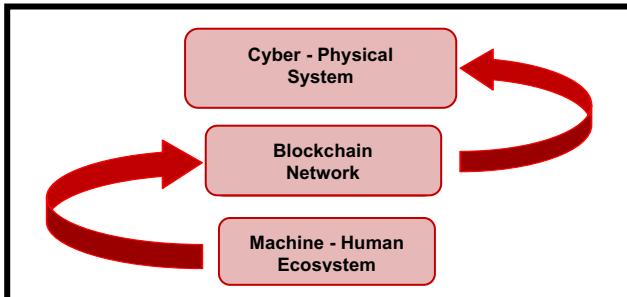


Fig 2. Evolution of the processes in digital economy author's adaptation

To perform those functions, the digital leader must:

- ✓ to know the principles of working in the digital environment;
- ✓ to apply the technologies and tools used in the digital environment;
- ✓ to have management knowledge and competences;
- ✓ to integrate human and machine work into a single and integrated system;
- ✓ to lead the team or organization to achieve strategic organizational guidelines;
- ✓ to facilitate value added for the team or organization through its behavior in the digital environment.

The search for new types of leaders with e-leadership skills is also being determined as deficit by the European Commission [16]. According to her, Europe needs 50,000 new digital leaders each year. At this point, it should be made clear that this deficit is not for IT professionals or managers, but for professionals with interdisciplinary training and the ability to manage teams and / or organizations in a new, even more dynamic global environment - the digital.

The basic knowledge, skills and competencies that a digital leader must possess are:

- ✓ skills in computer systems and technologies, mechatronics, robotics and artificial intelligence;
- ✓ business knowledge and potential;
- ✓ knowledge of the mechanisms of strategic business leadership and leadership in an organizational environment.

It can therefore be summarized that the digital leader is a system of integrated interdisciplinary knowledge, skills and competences (Figure 3), which can in principle be divided into two main groups:

- ✓ social, economic, legal and managerial knowledge, skills and competences in:
 - leadership in a business organization - achievement of certain organizational goals through team collaboration, which is planned, organized, coordinated, motivated and controlled on the basis of trust in a particular person who has specific

distinctive personal and organizational characteristics

- a leader;
- strategic business leadership - achieving leadership from a specific business system (economy, sector, organization, team) in a particular environment, according to a specific criterion or system of criteria;
- management - setting goals, administering, maintaining and developing the systems and structure of a particular economic entity on the basis of continuous monitoring and control;
- entrepreneurship - willingness to take risks, adapt to new development, use the opportunities of the environment (internal and external);
- digital entrepreneurship - the opportunity to create new organizational forms, products or services, while at the same time taking on a certain risk and using team collaboration and information technology systems.

- ✓ engineering knowledge, skills and competences in the field of:

- computer science;
- physics;
- robotics;
- mechatronics.

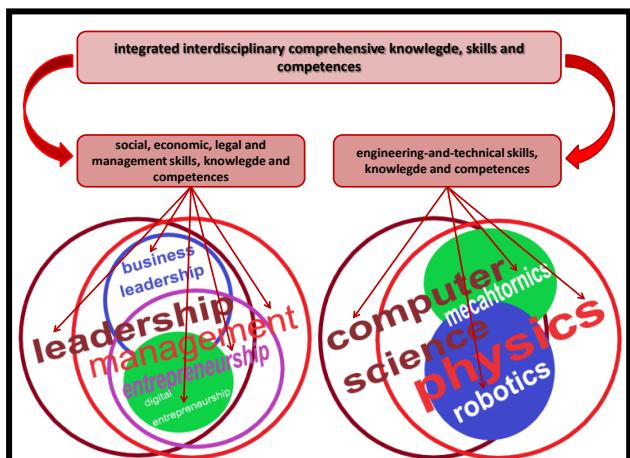


Fig 3. Knowledge, skills and competences of the digital leader author's adaptation

Synthesized interdisciplinary knowledge, skills and competences of the digital leader defines that digital leadership is a unified and integrated concept based on the complex use of information and communication technologies and human resources.

The digital leader must have certain quality characteristics, such as:

- ✓ analytical thinking;
- ✓ ability to solve problems;
- ✓ ability to motivate;
- ✓ ability to assess risk;
- ✓ creativity;
- ✓ innovation;
- ✓ creating visions.

These qualities of the leader also lead to the synthesis of the basic parameters of digital leadership, namely: a unified, integrated, systematic process in the virtual space for the analysis of a specific situation, based on the building and coordinating relationships between people, departments, organizations, planning and development of organizational

vision, change management, adding value to the business unit.

3. Results and discussion

Digital leadership added value in digital smart organizations is the result of optimization across the entire value chain. The cyber-physical systems accelerate the implementation of the principles of:

- ✓ resource efficiency - shrinking to minimum cost levels;
- ✓ resource productivity - increasing production capacity to its maximum.

The high-tech economy and the digital smart organization are characterized by rapid development. This causes a radical change in business models and traditional value chains. Through the rapid development of technology, innovation, robotics and artificial intelligence, preconditions are formed and new forms of value creation and employment are development.

The added value of digital leadership in digital smart organizations comes from optimal governance, which is the result of three objective functions:

- ✓ minimization of cost;
- ✓ increase productivity;
- ✓ effectiveness of team interaction.

Digital leadership skills lead to:

- ✓ effective business organization;
- ✓ high-tech economy.

The leader in the digital environment should have interdisciplinary qualification, be able to lead international teams, handle digital and information technology, strategic management tools and effective leadership behavior. In this regard, leadership skills contribute to:

- ✓ accelerating economic growth;
- ✓ increasing the innovativeness of the economy;
- ✓ increasing the competitiveness of the economic system;
- ✓ increase in financial and commercial turnover;
- ✓ optimization of global production processes.

The added value of digital leaders in digital smart organizations is related to:

- ✓ the ability to analyze and process big data sets and make real-time decision-making with the help of information and analytical systems with integrated artificial intelligence - this leads to greater flexibility in process management, reducing the time required for management decisions and as result - to a reduction in the price of the articles produced;
- ✓ the ability to dynamically organize business processes in terms of quality, time, risk, durability, cost and environmental impact - this leads to a reduction in the production costs of each item as a result of lower costs of resources, energy, labor and time, required for production;
- ✓ the ability to maintain a constant balance between materials and logistics chains - this leads to a reduction in the cost of resources and organization of production,

which in turn leads to a reduction in the cost of the articles produced;

- ✓ the ability to quickly design and organize processes, change production operations and compensate for losses in technological time - this leads to reduced production time and thus the cost of manufactured products;
- ✓ the possibility of continuous optimization and adaptation of production capacities with integrated artificial intelligence - this leads to a reduction in the costs of resources, energy, polluting emissions and thus of the total production costs;
- ✓ the possibility of return on investment of individual and specific orders, reflecting the client's requirements in terms of design, configuration, ordering, planning, production, operation, terms and changes in terms - this is related to increasing the production of specific individual orders - this leading to greater competitiveness and market stability for the business organization.

The limitations of the study are:

- ✓ there are no studies on specific scales of measurement of digital leadership;
- ✓ it is beyond the scope of this study to define definitions of leadership styles applied in the digital environment.

4. Conclusions

The analysis and synthesis of the problematic issues related to the added value of digital leaders in digital smart organizations require summarizing the following key conclusions:

- ✓ digital leadership is a unified and integrated concept by specific knowledge, skills and competencies leading to higher value added in digital smart organizations;
- ✓ digital leadership is manifested in a digital environment that leads the digital intelligent organization to greater flexibility, adaptability and operational in a global environment and that adds value;
- ✓ digital leadership systematically integrates the work of human resources working on computers or mobile devices on a network, thereby contributing to the integrated linking of the organizational structure with the human potential and efforts to meet the strategic benchmarks of the digital smart organization and thereby adding value to the results of the digital economic subject;
- ✓ digital leadership is achieved through the implementation of the basic management functions in digital environment in order to achieve the organizational goals and the relationships between the digital leader and the team / organization members are based on mutual trust - therefore the added value of digital leaders in digital smart organizations comes from the essence of their activity.

In addition, the main features of a digital leader should be defined:

- ✓ has the social, economic, legal, managerial and engineering knowledge, skills and competences to add value to digital smart organizations;
- ✓ works in the virtual space, where the simulation of processes, phenomena and operations is a tool for forecasting, analysis and evaluation;

- ✓ plan, organize, coordinate and control the operation of one or more computers or mobile devices;
- ✓ motivates the human resources working of computers or mobile devices.

In conclusion, digital leadership facilitates higher value-added for the business system in which it is implemented.

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