

Article

Trust in and Risk of Technology in Organizational Digitalization

Andrea Bencsik ^{1,*} , Dávid Máté Hargitai ²  and Anastasia Kulachinskaya ³ ¹ Department of Management, University of Pannonia, 8200 Veszprem, Hungary² Department of Marketing, University of Pannonia, 8200 Veszprem, Hungary; hargitai.david@gtk.uni-pannon.hu³ Graduate School of Industrial Economics, Peter the Great St. Petersburg Polytechnic University, St. Petersburg 195251, Russia; a.kulachinskaya@yandex.ru

* Correspondence: bencsik.andrea@gtk.uni-pannon.hu

Abstract: Organizational transformation for digitalization is a daily challenge for organizations. Successful change can be defined as the combined result of a number of factors, in which the attitude, trust and/or distrust of employees towards technology is of paramount importance. The aim of this study was to explore which factors most influence employees' trust in technology and how the risk they pose can be mitigated. The quantitative research analyzed 473 respondents (Smart PLS3, using SEM model) and came to the following conclusions. Employees' trust in technology depends primarily on the supportive role of management, and to a lesser extent on the digital readiness of the company and the training provided in the organization. The supportive role of management is a key element in the model, as it affects trust not only in a direct way, but also indirectly, through several pathways in the model. This means that the supportive role of leadership is clearly a decisive influence and its importance helps to assess the risk of trust or lack of trust.

Keywords: trust; digitalization; risk; leadership style; digital readiness; digital training



Citation: Bencsik, Andrea, Dávid Máté Hargitai, and Anastasia Kulachinskaya. 2022. Trust in and Risk of Technology in Organizational Digitalization. *Risks* 10: 90. <https://doi.org/10.3390/risks10050090>

Academic Editor:
Tatiana Kudryavtseva

Received: 21 March 2022

Accepted: 14 April 2022

Published: 20 April 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Digitalization and the phenomenon of digital transformation are fundamentally changing the way businesses and organizations operate (Collin et al. 2015). While it is seen as a major challenge for complex organizational change, the direction and depth of research in the area of transformation has not yet yielded irrefutable results. To date, predicting the impact of digital transformation remains uncertain, and there are conflicting and widely divergent predictions. Therefore, their organizational adaptation involves a certain degree of risk. There are new expectations for leaders of digital organizations, resulting in the need for a new style of leadership, called e-leadership. E-leadership refers to leadership through computer-mediated communication. (Wang and Torrisi-Steele 2017). Properly applied, transformational driving has been the most studied area in the last two decades (Kouni et al. 2018), making it the most cited leadership style. In the case of transformational leadership style, the leader uses his/her influence and enthusiasm to motivate his/her employees to change the organization. Burns (1978) first proposed the concept of this leadership style in 1978. His main expectation was that both management and employees should mutually contribute to the uplifting of each other and to improving morale and motivation. This new leadership style goes hand in hand with the need to change the existing organizational culture, which has been called e-culture/digital culture (Contreras et al. 2020). In general, e-culture refers to the cumulative results of people's creative activity and communication in the context of the introduction of information technology, characterized by the creation of free information space, virtual expression, remote technology, and the freedom of content (Drigas and Pouliou 2013). Producing successful organizational operations under such conditions is challenging and risky. The specificity of the modern era is that uncontrolled technological development has taken hold and its consequences have caused a major deformation in the values of employees and managers and in all other segments of society.

Although the concept of e-culture is still in its infancy, its emergence has a major impact on the way organizations operate, on managerial behavior, and on the effects it has on staff, since e-culture is nothing more than an expression of an information culture that aims to make the firm a digital organization (Llopis et al. 2004). Both the characteristics of e-leadership and e-culture can be associated with additional expectations that qualify organizational functioning, such as VUCA, gemba, agility, and learning organization (Mack and Khare 2016; Baran and Woznyj 2020; Romero et al. 2020; Soliman 2020). The impact of all of these has a strong influence on successful organizational functioning under conditions of digitalization. A prerequisite is the confidence of employees in using digitalization technology and the identification of the factors that influence it.

Since the digital transformation of organizations (through e-leadership tools in e-culture conditions) has a strong impact on the degree of operational risk, the aim of this study was to explore which factors most influence employees' trust in technology and how the risk they pose can be mitigated. The two research questions were as follows:

RQ1: How do the factors that influence the risks of digital organizational functioning (the supportive role of leadership, training provided by the firm and current digital organizational readiness) affect employees' trust in technology?

RQ2: What is the most important factor that can reduce the risk of mistrust? In the following chapters, after a theoretical overview (digitalization, modern management styles, trust, risk), the research methodology and the results of the study are presented, followed by a discussion and conclusions.

2. Theoretical Overview

2.1. Briefly about Digitisation

The Google search for “digitalization” returned 23,200,000 results in 0.54 s. This number showed that it is a concept that is becoming increasingly popular in everyday life. In the context of the content of the study, a search on the terms “digitalization and leadership” yields almost the same number of hits, 23,300,000 (0.53 s). This value indicates the popularity of the terms in professional fields. Digitalization has received more attention mainly in the field of information systems research, but nowadays, the impact of the technological dimension on business and human resources is also being studied in the field of management science (Van Laar et al. 2018). In terms of the number of scientific articles, the latter category yielded 19,600 hits in 0.03 s. It is therefore indisputable that this is a subject that demonstrates the wide interest of researchers and scientists. Previous research has found that digitalization is a transformation rather than a technological challenge (Kane et al. 2015). Digital transformation is permanently transforming companies in terms of strategy, work processes and employment (Blanka et al. 2022). The concept of digital transformation is described by different definitions in the literature. Among these, we have chosen the definition of the consultancy i-SCOOP (2016) to theoretically ground our study. “Digital transformation is the profound transformation of business and organizational activities, processes, competencies, and models to fully leverage the changes and opportunities of a mix of digital technologies and their accelerating impact across society in a strategic and prioritized way, with present and future shifts in mind.” For organizations in the business world, digital transformation also involves the development of new business models and rules, both externally and internally. An effective digital transformation program requires the development of digital skills in different areas of the organization (Westerman et al. 2012). In this sense, digital leaders are of paramount importance in the implementation of digital transformation programs, as they consider digitization as an integral part of business operations and develop a digital mindset to integrate information technology (IT) into the firm's business strategy (Sia et al. 2016; Benitez et al. 2022). Consequently, such activities lead to a transformation of the corporate structure or key business functions and processes (Verhoef et al. 2021).

Big data, 5G, artificial intelligence, blockchain, robots, drones, etc. may not sound foreign; however, the range of terms is a hallmark of the challenges facing organizations.

Businesses have faced many challenges in integrating new technologies, and as a result, the importance of information technology (IT) and information systems (IS) has been widely researched, as the impact of IT integration on all business dimensions is increasing (Martínez-Caro et al. 2020). As a result of Industry 4.0, digitalization and the demands that come with it are knocking on the door of executives every day. It is hard to get your bearings and find the tools to help solve real problems. Digital development means different things to different businesses (Carlson 2018). Sometimes it is just about optimizing workflows with IT tools, but often it is also about a complex change in operating models. The fear of digitalization and IT, which is sometimes age-specific, stems from uncertainty and is a serious risk factor. Therefore, managers have a role to play in knowledge transfer, awareness-raising, and attitude-shaping. It is key for leaders to develop an organizational culture that inspires and supports change and the emergence of new and innovative solutions (Paul 2019). The almost unanimous conclusion of international research is that the widespread adoption of digital technologies by businesses has significant added value, improving the competitiveness of businesses and hence the economy as a whole (Soomro et al. 2020; Gfrerer et al. 2021).

2.2. The Importance of Leadership

In order to ensure that the changes brought about by digitalization are smoothly implemented in the organization, and that employees are confident and open to the acquisition and application of the skills required by new technologies, a leadership style and behavior is needed that can create the conditions for meeting these expectations.

Leadership, as in the literature on leadership styles, is an area of science with a wide range of research opportunities and a rich literature (Jackson and Parry 2011; Schein 2010; Yukl 2013; Filep 2018). In recent years, research has focused primarily on the personality traits of leaders (Özbağ 2016; Durante 2017), while previously, research has focused on organizational behavior (Blanchard 2008; Northouse 2007; Gordon 2008; Levine 2007), contingency-based leadership, and context-based adaptive practices (Blanchard et al. 2013). Accelerating development and its consequences has brought complex leadership research to the fore. As a result, the study of values-based leadership has come to the forefront of research on organizations in a changing world, together with complementary strands of transformational and authentic leadership (Bass and Riggio 2006; Copeland 2014; Durante 2017). With digitalization and the emergence of e-leadership, the need for a leadership behavior that helps employees to adapt, be open, and receptive to the challenges brought by digital technology has emerged. Such qualities are the characteristics of value-based leadership (VBL), which is a major trend in contemporary leadership (Bass and Riggio 2006; Nichols 2016; Shahzad et al. 2021). Since its emergence, VBL has evolved alongside a number of parallel trends, such as “Servant Leadership” (Eva et al. 2019; Gandolfi and Stone 2018), “Connective leadership” (Kezar and Wheaton 2017; Lipman-Blumen 2017), and “Contextual leadership” (Parra-Cardona et al. 2021). Two of the most dominant VBLs are transformational leadership (Klaic et al. 2020) and authentic leadership (Pioli et al. 2020; Maziero et al. 2020), so we focus on these in the following. Key characteristics of value-based leadership (O’Toole 1995).

- Integrity: a commitment to what is morally right and towards equality, the empowerment of people, and a motivation to act.
- Trust: the aspirations and values of the staff are the essence, the leader becomes the bearer of these. Trust in each other (leader vs. employee and vice versa) strengthens the team.
- Listening: a leader who listens to his followers or members of the organization and understands the wishes of his organization.
- Respecting followers: good leadership is more like teaching than commanding. A leader is both a teacher and an empowerer, encouraging members to follow certain values. Leadership is about leading together.

The above characteristics, for the purposes of our research, can be assessed in relation to the kind of leadership behavior that digital transformation requires in the life of organizations. In order to assess this correctly, nuanced versions of VBL—transformational and authentic leadership—must also be weighed.

2.3. Transformational Leadership—A Source of New Ideas

A transformational leader sees the organization as a unit in which he or she inspires and motivates change through persuasion and motivation (Yukl 2013; Andriani et al. 2018). He is a change agent who defines the organizational reality through the articulation of a vision and the generation of strategies to achieve it (Kouni et al. 2018). Transformational leaders are also referred to as charismatic leaders because of their ability to motivate their followers to achieve their organization's goals. They inspire their employees to achieve results beyond expectations. They give them autonomy, which allows them to make their own decisions, provided they are properly trained. They also excel in conflict management. They are well-versed in the wider business environment and are also role models in the organization. The most typical characteristics of transformational leaders are (Basham 2012):

- openness to new thinking;
- talent for broadening minds;
- commitment to active listening;
- tolerance for intelligent risks;
- willingness to accept responsibility;
- trust in team members;
- ability to inspire participation.

The four key components of transformational leadership are taken from the book “Transformational Leadership” (Bass and Riggio 2006).

Intellectual stimulation—leaders stimulate staff effort and self-reflection by challenging creative and innovative assumptions without being critical or negative about their ideas.

Individual consideration—open the lines of communication so that employees can freely share their ideas. They take on a teaching and learning role, while paying special attention to the needs and wants of each individual, providing a safe environment for continuous development.

Inspirational motivation—supporting staff to work with passion and motivation to achieve goals. Leaders inspire and motivate in order to lift team spirit and challenge the staff, while giving meaning and higher purpose to their work.

Idealized influence—they lead by example in the organization. Transformational leaders work towards forms of idealized influence such as leading by example, optimism and confidence, and a high level of a moral and ethical stance in their decision making.

These four “I’s” provide the basic philosophy of transformational leadership. They help to distinguish it from similar styles of leadership philosophies, (e.g., visionary leadership), and complement styles with opposite approaches (e.g., transactional leadership).

Together, these four components can be seen as the foundation of transformational leadership, which is still a powerful and active concept today (Kakabadse 2011; Rogers 2016). Organizations led by this type of leader are generally successful and their members are committed. Researchers have found that this leadership style has a positive impact on the group and on the well-being of employees (Kouni et al. 2018; Klačić et al. 2020; Asbari 2020). Namely, for both trust and a sense of meaning, individual challenges serve the development of employees, which positively affects employee well-being. The transformational style of leadership can be highly effective when used appropriately, but it may not be the best choice in all situations (Anwar 2016).

2.4. Authentic Leadership

Leadership consultant and academic Bill George, along with several scholars (Avolio and Gardner 2005; Pioli et al. 2020), has articulated the need for leaders who lead with pur-

pose, values, and integrity; leaders who build enduring organizations, who motivate their employees to deliver excellent service and create long-term value. These expectations have been linked to principles of positive psychology and the concept of ‘authentic leadership development’ (ALD) has been coined (Copeland 2014). Authentic leaders must possess intrinsic qualities that go beyond transformational and charismatic leadership. Combined with the work of Gardner et al. (2005), a conceptual consensus has emerged on the four qualities expected of authentic leaders (Walumbwa et al. 2008). These are:

Self-awareness: the leader strives to understand how to create meaningful interactions, but is also able to assess their own shortcomings.

Relational transparency: the leader builds trust and shares feelings and thoughts, openly sharing information with others.

Balanced processing: rigorous, objective data analysis is conducted before a decision is reached. Ability to be objective, have an optimal self-assessment, and process relevant and irrelevant information without making ignorant, exaggerated, or distorted assumptions.

Internalized moral perspective: refers to the leader’s ability to integrate self-regulatory functions, guided by values and moral norms, as opposed to social pressures from the group. Authentic leaders align their values with their intentions and actions.

As can be seen from the above, the expectations that are necessary for leaders to support employees through appropriate communication, engagement, motivation, and leading by example during the transition to a new situation make the transformational leadership style the right choice. The need for the characteristics of a transformational leader can be clearly explained in terms of openness to change, adoption of digitalization, and acceptance of the development of digital solutions. Among the required attributes, one should be prioritized, that of confidence. Building trust in the organizational culture, building trust in the relationships between employees and with managers, and last but not least, in the relationship between employees and technology. Leadership by example, motivation, and good communication are prerequisites for building trust, but professional preparation, knowledge, and training are also essential for the trusting, risk-free use of technology.

2.5. Organisational and Digital Trust

Lack of trust is clearly a key challenge for organizations struggling to make the transition to the digital age. Management generally sees and knows that new technology will lead to better decisions, quality customer experience, and higher financial results. They are also aware that machine learning is necessary if they are to remain competitive, agile, and lean (Xu et al. 2014). The one thing that often holds organizations back from improving is trust. Most leaders’ trust problems can be traced back to three main trust deficits: trust in data, trust in analytical models, and trust in interpretive capabilities (Jensen et al. 2015; Almarashdeh 2018; Salam 2017). A recent study (Siau and Wang 2018) showed that in order to start changing the business model mindset of an organization, the first step is to understand the need for trust. According to 76% of CEOs, employee trust is critical to business competitiveness (Ejdys 2018). A total of 60% of organizations highlighted that their biggest challenge in data management is “not finding relevant, value-added data”. Before COVID-19, an estimated 30% of pharmaceutical products sold in emerging markets were counterfeit. This data confirms that consumer goods supply chains need end-to-end data transparency now more than ever. These problems can be avoided with the right digitalization support (Carradore 2021).

2.6. The Risks of Digital Transformation and Lack of Trust

Organizations across all industries are at various stages of digital transformation, connected to digital networks, and generating vast amounts of data, leading to the rapid development of artificial intelligence (AI). This transformation is bringing major benefits in many areas of the economy: increased productivity, reduced lead times, improved working conditions, reduced turnover, more inspiring and higher value-added tasks, and a

more balanced and varied workload (Salam 2017). However, the digital age also has its downsides. The frequency and severity of cyber-attacks on companies, individuals, and critical physical infrastructure are increasing. The amount of data that surrounds us all (both as individuals and at the corporate level) is growing at such a rapid pace that it is difficult to judge whether the information we are being exposed to is true or false. We live in a very complex, chaotic world. Cyber-attacks and reservations about the reliability of online data erode trust and pose risks to organizations in all areas (Ragulina et al. 2021; Iten et al. 2021). To overcome these challenges, organizations need to approach trust in new ways. In the past, we have mainly talked about trust based on interpersonal relationships (Trust 1.0), and then trust in governments, banks, and large corporations as intermediaries (Trust 2.0). This is complemented by Trust 3.0, which is trust in distributed digital technologies (Gangel 2019). The areas and management options for the risks posed by digital transformation are summarized in Table 1 below.

Table 1. Risk areas and their management options.

Domain	Risk	Treatment
Leadership	Lack of competence	Training
Organizational structure	Inflexible, closed	Culture shaping
Primary value-creating processes	Preparedness imbalanced	Catching up
Support and management processes	Remain in the background	To consciously achieve rapid success(es) in transformation, to root the foundations of a culture of change
Common tasks	Entrenched (bad) organizational routines are difficult to change	Thoughtful process improvement, managed change management
Rare tasks	Unpreparedness	Organize such tasks on a single platform
Organizational resistance	Intellectual, but mostly emotional resistance	Managed change management
Process automation	“Mule” solutions, with human intervention	Implement a fully digitized, automated process
Transformation of an organization	Slow, inflexible	Rethinking, streamlining the organization
Middle management level	Capability gaps, disinterestedness	Capability development or replacement
Digital capabilities	Immature, uneven, unskilled	Development, training

Source: own construction.

The table shows that risks can be reduced and/or eliminated through the right management style, training, education, and upgrading of the digital readiness of the organization. The characteristics and potential risks of the leadership styles and trust required by digital technology are summarized in Table 2. The same shades of grey indicate the same requirements.

Digital skills are a prerequisite for digital confidence. Countries where digital skills are lagging behind have the lowest levels of trust in technology. This is no coincidence, because who would trust something they cannot use? However, this correlation provides an opportunity to help build trust in technology by supporting skills acquisition (Ozlati 2012). While there are also large differences between countries in this respect, Western economies often struggle to address the problems of, for example, recruiting—and retaining—ICT professionals (Ejdys et al. 2019).

Table 2. Characteristics of leadership styles and the trust required by digital technology.

Attributes of a Transformational Leader	VBL (Value-Based Leadership)			Digital Technology Trust Requirements	Risks of Inappropriate Leadership Behavior (Style)
	Integrity	Hearing	Followers Respect		
	Trust				
	Transformational Leadership	Authentic Leadership			
Openness to new thinking	Intellectual stimulation	Self-awareness	Trust 1.0; 2.0; 3.0	Closed-mindedness due to mistrust, lack of ideas, lack of learning, under-qualification, feeling pressured to work, inappropriate working practices, conflicts, inflexibility, fear, confused vision	
Talent for broadening minds	Individual consideration	Relationship transparency	Digital capability		
Commitment to active listening	Inspirational motivation	Balanced processing	Individual interest		
Tolerance for intelligent risks	Ideal effect	Internalized moral perspective	Motivation		
Willingness to accept responsibility					
Trust in team members					
Ability to inspire					
Participation					

Source: own construction.

In our practical research, we investigated the relationship between the elements of the theoretical model supported by the literature (digital technology readiness—leadership support, skills—competences, trust in technology). These factors have the greatest influence on staff trust in technology and the risk of a lack of trust.

3. Research Methodology

To explore the relationships between latent variables and manifest variables, we used the structural equation model (SEM), which allows simultaneous factor and regression analysis. Considering the complexity of our model, the ordinal scales and the number of elements in our sample, we chose the partial least squares (PLS) technique (Haenlein and Kaplan 2004; Hair et al. 2011; Kazár 2014). Smart PLS 3 software was used to build the model and perform the calculations. For PLS-SEM, the normal distribution of variables is not a prerequisite, and the analysis can be used as an exploratory study, using parameter estimation to determine the effects (Ringle et al. 2015).

PLS path analysis is a variance-based method where the full explained variance of the dependent latent variables is maximized (Kazár 2014). During modeling, two parts need to be separated, the external model and the internal model. The external model describes the relationships between manifest variables and latent variables. The internal model identifies causal relationships between latent variables. However, the estimates of the two models are not made separately, but simultaneously.

In the first step, the values of the latent variables are approximated externally as a linear combination of the corresponding manifest variables. In the second step, the internal weights (path coefficients) are estimated for each latent variable. In the third step, the values of the latent variables are approximated internally, using the external values of the adjacent latent variables and the internal weight coefficients defined in the previous step. Finally, the external weights are estimated (T. Nagy and Bernschütz 2017).

There is no global indicator to examine the fit of the whole model, therefore a two-step procedure is proposed, in which the external model and the internal model are evaluated separately (Chin et al. 2013). External models can be evaluated using various criteria, which are presented in detail in Section 4.1 on the examined data. If the external model is reliable and valid, the internal model can be evaluated. This includes, on the one hand, the evaluation of the explained variance of the dependent (endogenous) latent variables, which is measured by the coefficient of determination (R^2) on the other hand, the estimated standardized path coefficients (β coefficients). The latter can be performed using the results of the bootstrap resampling procedure (Hair et al. 2022).

3.1. Data Collection

The data used in the analysis phase of the research was derived from a primary source, an online questionnaire survey completed in the spring of 2021 by managers of manufacturing companies in Hungary. To reach potential respondents, we used the Orbis database, which contains business information on nearly 400 million companies and legal entities worldwide. The filtering process took into account the location (the country under study), the size of the company, and the sector to which the company belongs based on its main activity (agriculture and livestock; mining; construction; food and tobacco products; wood, furniture and paper products; printing and publishing; basic metals and fabricated metal products; electronic and industrial products; computer hardware; chemical products (rubber, plastics)). As a result, 36,062 companies were selected as potential respondents, including an email address. The questionnaire was administered online via the Lime-survey platform. The anonymous questionnaire consisted of closed questions that took approximately 15–20 min to complete and covered the following topics:

- (I) introductory questions, perception and experience of digitalization (24 questions);
- (DT) digital toolbox: Industry 4.0 and its applications (26 questions);
- (HM) human–machine interface: trust and fear (19 questions);
- (LEA) the supportive role of leadership (9 questions);

- (OC) organizational culture—learning organization (9 questions);
- (OR) data about the organization (11 questions).

3.2. The Sample

The survey yielded an evaluable sample of 1047 respondents, but not all questions were required to be answered, and Likert-type questions were allowed to be marked “don’t know” to avoid data bias and were treated as missing values in our analyses. This allowed us to work with 473 respondents ($n = 473$) after data cleaning. These respondents provided answers for all the variables used in our path analysis. Examining the data of the Hungarian Central Statistical Office (KSH 2021), the sample can be considered limitedly representative both in terms of the form of operation and the number of employees.

The general characteristics of the sample (Table 3) show that the respondents were typically top-level leaders (71%), with a significantly smaller proportion of middle-level (11.8%) and bottom-level (3.2%) leaders. The most common form of operation was the limited liability company (79.9%), followed by the private limited company (10.4%) in terms of frequency distribution. Half of the respondents work in a small enterprise (less than 50 employees), while almost a third work in a medium (19.7%) or large enterprise (10.1%). As general information on the organization was not required, a small percentage of missing data was also provided.

Table 3. Characteristics of the sample.

	Variable	Number of Respondents (Persons)	Distribution (Percent)
Operational form	Ltd	378	79.9%
	Limited liability company	16	3.4%
	Public limited company	2	0.4%
	Sole proprietor	5	1.1%
	Closed joint stock company	49	10.4%
	Open joint stock company	2	0.4%
	Missing data	21	4.4%
	Total	473	100.0%
Position	Top-level leaders	336	71.0%
	Middle-level leaders	56	11.8%
	Bottom-level leaders	15	3.2%
	Intellectual staff	45	9.5%
	Missing data	21	4.4%
	Total	473	100.0%
Employees’ number	10 persons or less	66	14.0%
	Between 11–50 persons	237	50.1%
	Between 51–250 persons	93	19.7%
	Above 250 persons	48	10.1%
	Missing data	29	6.1%
	Total	473	100.0%

Source: own construction.

3.3. Theoretical Model

The factors revealed in the theory were measured in the questionnaire with four-point scales. A value of one indicates that the respondent does not agree with the statement at all, while a value of four indicates that he/she fully agrees with the statement. In our model

(Figure 1), we measured the supporting role of leadership (five items) with statements that support the adoption of a new technology and are consistent with the characteristics of transformational leadership. That is, the role of information (ideal effect), the possibility of expressing employee opinions (individual consideration), the incorporation of new ideas (intellectual stimulation), and the expression of personal development provided by technology (inspirational motivation).

In the construction of training (four items), the different competence development and technology-related training courses (whether standardized or customized) in the company were considered. The digital readiness of companies (ten items) was measured by the level of utilization of Industry 4.0 tools and applications related to manufacturing, logistics, and AI. We hypothesized that these three factors, which are interrelated, influence workers' trust in technology (4 items), as reflected in their openness to new technology and its impact on workflow facilitation.

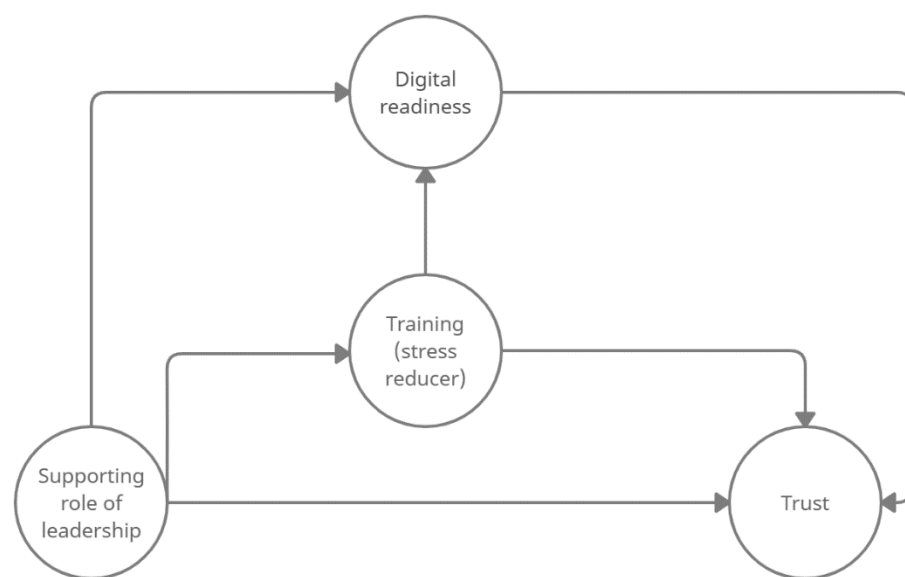


Figure 1. Theoretical model.

4. Results

4.1. Examination of External Model Conditions

The constructs in the model need to be pre-tested for reliability and validity. The internal consistency of latent variables can be determined using the Cronbach's alpha index, which should take a value of at least 0.6 even in exploratory studies, but a value between 0.7 and 0.9 is considered satisfactory (a value above 0.95 occurs when redundant elements are included in the latent variable) (Hayduk and Littvay 2012). Also, for the composite reliability indicator, a result above 0.7 is considered acceptable. The reliability of the indicators can be checked by examining the factor weights, which should have a minimum value of 0.7, while the average variance extracted (AVE) for convergence validity should be above 0.5. To check the discriminant validity, the Fornell and Larcker (1981) test can be used, according to which the square root of the AVE of a given latent variable must be greater than the correlation coefficient between that latent variable and all other latent variables. The values in Table 4 show that the above conditions are met for all four variables. In the case of our model based on confidence in technology, the use of PLS overestimation is justified since the normality condition is not met for each of the items constituting the constructs (Kolmogorov–Smirnov test for all variables $p < 0.05$). The aim of the model was to understand and explore the employees' trust in technology, i.e., to what extent the trust factor can be explained by the constructs we selected. For the reason described in the research background, the analysis was run on the basis of 473 valid responses, with seven iterations.

Table 4. Elements of the theoretical model and their statistical characteristics.

Construction	Item	Standardized Factor Weight	Average	St.Dev
The supporting role of leadership $\alpha = 0.873$ AVE = 0.664 CR = 0.908	Management explains to employees the importance of introducing new technology.	0.8464	2.63	0.869
	Before introducing new technology, management shall also seek the opinion of the employee concerned.	0.8108	2.4	0.866
	Management sets a good example in the use of new technology.	0.8616	2.79	0.891
	Management will explain to employees that the new tool will ensure their personal development.	0.8457	2.59	0.861
	The new ideas of the employees are incorporated by management into the work process.	0.7023	2.76	0.78
Education (stress reduction) $\alpha = 0.856$ AVE = 0.696 CR = 0.901	The organization provides mandatory online competence development training.	0.8392	2.03	1.065
	Employees can register for these courses on a voluntary basis.	0.8047	2	1.047
	The organization provides training for employees before the introduction of new, modern technology.	0.8566	2.52	1.087
	There is an individualized training program that includes modern technologies.	0.8369	2.15	1.067
Digital readiness $\alpha = 0.923$ AVE = 0.593 CR = 0.935	Level of digitalization exploitation—digital tracking of raw materials and products	0.7012	2.35	0.911
	Level of digitalization exploitation—automated material handling	0.7757	1.63	0.789
	Digitalization exploitation level—supply chain integration and transparency	0.8336	2.01	0.870
	Level of digitalization exploitation—Industry 4.0 compatibility of the tool park (digital data provision)	0.8029	1.95	0.810
	Level of digitalization exploitation—production automation	0.7877	1.83	0.865
	Level of digitalization exploitation—application of augmented reality solutions	0.7406	1.55	0.764
	Level of digitalization exploitation—M2M—machine to machine communication	0.7426	1.82	0.814
	Digitalization exploitation level—using artificial intelligence	0.7459	1.51	0.742
	Level of digitalization exploitation—automated fault finding and forecasting (e.g., maintenance scheduling)	0.7740	1.81	0.822
Trust $\alpha = 0.923$ AVE = 0.593 CR = 0.935	Digitalization exploitation level—real-time inventory management (automated entries)	0.7919	2.01	0.924
	Workers have confidence in modern technology	0.8420	2.58	0.706
	Workers are confident that new technology will make their jobs easier	0.8512	2.59	0.774
	Workers are open to new technology.	0.8539	2.50	0.754
	The organization's management is open to new technology	0.7660	3.07	0.832

Note: α is the Cronbach's index measuring construct reliability, while AVE is the average variance extracted and CR is the composite reliability index.

4.2. Internal Model Results

Prior to reviewing the results of the internal model, it is necessary to test the significance of the path coefficients set up, which can be tested by *t*-tests using the bootstrap distribution. In the bootstrap procedure, subsamples are created by randomly sampling observations from the original data set, i.e., a PLS path model is created for each bootstrap sample. The number of subsamples should be large enough (at least 5000 according to Hair et al. (2022)) to ensure stability of the results. It is possible that a path coefficient estimated from the bootstrap sample has the opposite sign to the path coefficient estimated from the original sample, which is handled by the program's individual sign change option (Kazár 2014). The *p*-values in Table 5 show that at the five percent significance level, each explanatory variable has a significant effect on its corresponding explained variable.

Table 5. Variables and path coefficients.

	Path Coefficient			<i>t</i> -Value	<i>p</i> -Value
	Original Sample	Mean-Bootstrap Sample-	St. Deviation-Bootstrap Sample-		
Digital readiness -> trust	0.1635	0.1670	0.0484	3.3759	0.0008
Supporting role of leadership -> trust	0.4460	0.4447	0.0448	9.9465	0.0000
Supporting role of leadership -> digital readiness	0.2058	0.2056	0.0505	4.0721	0.0001
Supporting role of leadership -> training (stress reducer)	0.5046	0.5050	0.0321	15.7219	0.0000
Training (stress reducer) -> trust	0.1072	0.1070	0.0429	2.4983	0.0128
Training (stress reducer) -> digital readiness	0.3704	0.3704	0.0524	7.0616	0.0000

Source: own construction.

This allows us to examine the direct effects between our latent variables (standardized path coefficients) as well as the indirect effects, which can be calculated as the sum of the standardized path coefficients of the indirect paths multiplied by the standardized path coefficient of the direct path. In the final model (Figure 2), the exogenous variable is the supportive role of leadership, while the endogenous latent variables include digital readiness, education as a stress-reducing effect, and trust. The arrows in the figure indicate significant relationships, while the values above them represent the path coefficients indicating the strength of the relationship, suggesting that positive effects are expected for all pairs of variables.

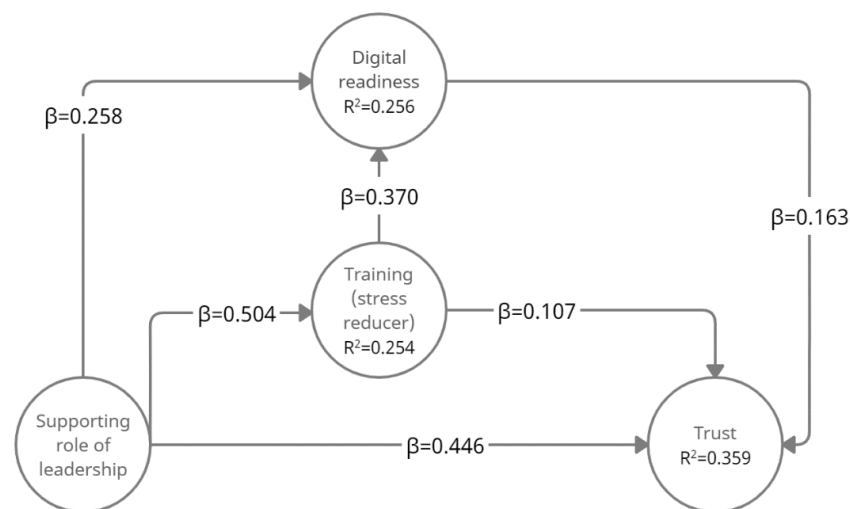


Figure 2. Impact of model variables.

Employees' trust in technology was mainly influenced by the supportive role of management ($\beta = 0.446$), and to a lesser extent by the digital readiness of the company ($\beta = 0.163$) and the training provided in the organization ($\beta = 0.107$). Training directly influenced digital readiness more strongly ($\beta = 0.370$) than the supportive role of leadership ($\beta = 0.258$). The supportive role of leadership appeared as a key element in the model, as it affected confidence not only directly, but also indirectly. On the one hand, through digital readiness (0.258×0.163), and on the other hand, through education (0.504×0.107), and finally, through education and the digital readiness pathway ($0.504 \times 0.370 \times 0.163$). The sum of these effects gives the indirect effect of the supportive role of leadership, which with a value of ($\beta = 0.126$) shows that it is just below the total effect of training ($\beta = 0.107 + (0.370 \times 0.163) = 0.167$). It was also found that the total effect of digital literacy ($\beta = 0.163$) is essentially the same as the effect of education on confidence. The explanatory power of the constructed model is determined by the coefficients of determination. Employees' confidence in technology is explained by the other three factors in the model at 35.9%.

The analysis of the effects shows that the supportive role of management is clearly the most important factor in the development of trust, while training and the digital readiness of the company are almost equally important (see Table 6). It is important to note that if the current level of training or digital applications used in the organization were ignored, the explanatory power would fall below 30%.

Table 6. Effects of latent variables in the model.

	Trust	Digital Readiness	Training
		Direct effect	
Digital readiness	0.1635		
Supporting role of leadership	0.4460	0.258	0.5046
Training (stress reducer)	0.1072	0.370	
		Indirect effect	
Digital readiness			
Supporting role of leadership	0.1263	0.187	
Training (stress reducer)	0.0605		
		Total effect	
Digital readiness	0.1635		
Supporting role of leadership	0.5723	0.4446	0.5046
Training (stress reducer)	0.1678	0.3704	

Source: own construction.

5. Discussion

International studies have shown that preparing for digitalization, organizational and technological change is a major challenge for both managers and employees (AlHogail 2018; Hunady et al. 2020). According to Deloitte's research, by 2025, most competitive companies will automate all repetitive financial processes, except strategic tasks. ERP systems, big data, and blockchain technology will be the key to automation (Deloitte 2021).

Also, previous research has shown that the biggest barrier to such a transformation is staff distrust of technology (Almarashdeh 2018). According to research by the Nielsen Norman Group, when people do not understand exactly how a system works, they come up with unique—and usually flawed—explanations and myths. A lot of technology myths arise from a lack of trust in digital tools, e.g., privacy, security, saving money (Nemeth 2018). In our theoretical research, we concluded that since the influence of leadership is crucial in the change process, a style that can provide the most support to employees through its decisions, interventions, and behaviors is needed. Although the leadership style required in such situations has not been the focus of research to date, our theoretical research suggests that a transformational leadership style is the most appropriate. Its characteristics can provide a background that ensures an appropriate level of preparedness to overcome the challenges mentioned above. The results of our research confirm the findings of

previous international research that the supportive role of leadership has the greatest impact on the development of trust (Rogers 2016; Carradore 2021). This supportive role involves management's professional communication to employees about the importance of adopting new technology, complemented by the opinions received from employees, incorporating their new ideas. When thinking about designing a company for the digital age, too many leaders focus on strategy rather than the minutiae of implementation. The drive for seamlessness must start with top management. It is the responsibility of senior management—as they lead their companies to the reimagined state—that leaders themselves must evolve, and evolve dramatically (Ross 2019).

The leader, through his/her behavior, sets an example and vision for their personal development. Providing the opportunity to acquire the necessary competences by organizing individual and joint training courses, which staff can attend on a voluntary basis. Competency training in the form of online training is mainly aimed at learning to use the latest technologies. The management thus complements its behavioral patterns with coaching courses, all of which serve to build trust. The digital and technological readiness of companies is primarily a matter of the technical conditions, which are partly constraints and partly opportunities. It is both a constraint, because you have to learn how to use them to do your job, and an opportunity to put the skills acquired through education into practice. Technology is changing fast, but organizations are changing much more slowly (Westerman 2019). This is termed George's law and is the reason why digital transformation is more of a leadership challenge than a technical one. Large organizations are much more complex to manage and change than technologies because they move many people who are harder to manage. Technology systems act on instructions and technology components do what they are designed to do. However, human systems are quite different, so changing an organization is not nearly as easy (Westerman 2019).

McKinsey's research points to a number of factors that can improve the chances of digital transformation success. These factors fall into five categories: appointing the right digitally savvy leaders, building skills for the workforce of the future, empowering people to work in new ways, digitally modernizing everyday tools, and communicating frequently using traditional and digital methods (Martin 2018).

In this light, the results of our research reflect the expectations of the literature (Ejdys 2018; Foerster-Metz et al. 2018; Klein 2020; Gfrerer et al. 2021), demonstrating that all elements of the model are interrelated and serve to increase trust in technology and digital technology through direct and indirect links in the pathway model. These results also point to the choice of leadership style as the greatest risk. As this factor has the greatest impact on trust, it is the wrong choice of leadership style that poses the greatest risk. If the leadership has the qualities and knowledge that cover the characteristics of transformational leadership, the risk to trust can be substantially reduced. In other cases, the absence or distortion of the most influential factor is likely to increase staff resistance to digitalization, with quantifiable consequences for the success of the organization.

A novel outcome of this research is the establishment and testing of a model relationship framework. The supportive role of leadership is clearly a decisive influence and its significance helps to assess the risk of trust or lack of trust. It is surprising that the direct influence of education has less impact on trust in technology. It is also surprising that existing technical and technological equipment does not have a sufficient influence and motivation to work with confidence. These findings open up further avenues of research and provide motivation to explore other relationships.

6. Conclusions

Based on the above results, the following answers to our research questions can be formulated.

Q1: All of the factors examined (the supportive role of management, training provided by the company, and the current digital readiness of the organization) have an impact on the success of the digital transformation of the organization, which depends on the attitude of

employees towards technology. This attitude takes the form of trust in technology. Across the pathway model as a whole, management buy-in had the strongest impact and in-house training had the least impact. In terms of direct effects, training had a stronger impact on digital readiness than the supportive role of management, digital readiness had a stronger impact on trust than training, and the supportive role of leadership was the strongest.

Q2: The supportive role of leadership is the key element because it affects trust not only directly, but also indirectly. On the one hand through digital readiness and on the other hand through education, and finally through education and the digital readiness pathway. The sum of these influences gives the indirect effect of the supportive role of leadership, which was also the strongest influence. The impact of digital readiness and education on trust was converging.

The contribution of the research findings to the theory: after reviewing the literature, we tested the relationship between trust in digital technology, the supportive role of leadership, organizational digital readiness, and education, based on a proprietary model of transcription and insertion. In all cases, the relationship between the elements tested was detectable, but the supportive role of leadership was of paramount importance, which also determines the role of leadership behavior in influencing risk.

Corporate management should pay attention to the following results: the digital transformation should not be primarily about increasing the number of technical tools and solutions or raising the technical level, but about human resources, training employees, and supporting them in acquiring the necessary competences. It is useless to have the highest level of equipment if fear and mistrust prevent the use and integration of digital technology into everyday processes. The application of a uniform, comprehensive risk management system within the organization can ensure the definition of corporate strategy, the protection of corporate assets, the transparent operation of the business, the support of efficient management, and the successful implementation of digital transformation. The development of good risk management practices, based on this model, requires the application of the characteristics of transformational leadership (with a focus on the role of HR in organizing training), managerial support, motivation, communication, and leading by example.

A limitation of the survey is the limited representativeness of the sample and the low level of willingness to respond. The research was limited to a single country and comparative studies would be worthwhile. The number of survey factors included in the model was limited and it is worth expanding it further and testing a model with these additional factors. Given the lack of research results examining the same correlations, there were limitations to the comparison. In further research, building on expert interviews, post-qualitative analysis could be used to test the validity of the results and extend the studies to include organizational, technological, and employee trust.

Author Contributions: Conceptualization, A.B.; Methodology, A.B. and D.M.H.; Software, D.M.H.; Validation, A.B., D.M.H. and A.K.; Formal analysis, A.B. and D.M.H.; Investigation, A.B. and D.M.H.; Resources, A.B. and D.M.H.; Data curation, A.B. and D.M.H.; Writing—original draft preparation, A.B.; Writing—review and editing, A.B. and D.M.H.; Visualization, D.M.H.; Supervision, A.B. and D.M.H.; Project administration, A.B. and A.K.; Funding acquisition, A.B. All authors have read and agreed to the published version of the manuscript.

Funding: This work has been implemented by the TKP2020-NKA-10 project with the support provided by the Ministry for Innovation and Technology of Hungary from the National Research, Development and Innovation Fund, financed under the 2020 Thematic Excellence Programme funding scheme.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the first author.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

References

- AlHogail, Areej. 2018. Improving IOT Technology Adoption through Improving Consumer Trust. *Technologies* 6: 64. [\[CrossRef\]](#)
- Almarashdeh, Ibrahim. 2018. The Important of Service Quality and the Trust in Technology on Users Perspectives to Continues Use of Mobile Services. *Journal of Theoretical and Applied Information Technology* 96: 2954–72.
- Andriani, Septi, Nila Kesumawati, and Muhammad Kristiawan. 2018. The influence of the transformational leadership and work motivation on teachers performance. *International Journal of Scientific & Technology Research* 7: 19–29.
- Anwar, Kofand. 2016. The relationship between transformational leadership characteristics and effectiveness: A case study of construction companies in Erbil. *International Journal of Science Technology & Management* 5: 250–56.
- Asbari, Masduki. 2020. Is Transformational Leadership Suitable for Future Organizational Needs? *International Journal of Social, Policy and Law* 1: 51–55. [\[CrossRef\]](#)
- Avolio, Bruce J., and William L. Gardner. 2005. Authentic Leadership Development: Getting to the Root of Positive Forms of Leadership. *The Leadership Quarterly* 16: 315–38. [\[CrossRef\]](#)
- Baran, Benjamin E., and Haley M. Woznyj. 2020. Managing Vuca. *Organizational Dynamics* 50: 100787. [\[CrossRef\]](#)
- Basham, Lloyd Moman. 2012. Transformational Leadership Characteristics Necessary for Today's Leaders in Higher Education. *Journal of International Education Research (JIER)* 8: 343–48. [\[CrossRef\]](#)
- Bass, Bernard M., and Ronald E. Riggio. 2006. *Transformational Leadership*. New York: Psychology Press. [\[CrossRef\]](#)
- Benitez, Jose, Alvaro Arenas, Ana Castillo, and Jose Esteves. 2022. Impact of Digital Leadership Capability on Innovation Performance: The Role of Platform Digitization Capability. *Information & Management* 59: 103590. [\[CrossRef\]](#)
- Blanchard, Kenneth H. 2008. Situational leadership. Adapt your style to their development level. *Leadership Excellence* 25: 19.
- Blanchard, Kenneth H., Patricia Zigmari, and Drea Zigmari. 2013. *Leadership and the One Minute Manager: Increasing Effectiveness through Situational Leadership*. New York: William Morrow.
- Blanka, Christine, Barbara Krumay, and David Rueckel. 2022. The Interplay of Digital Transformation and Employee Competency: A Design Science Approach. *Technological Forecasting and Social Change* 178: 121575. [\[CrossRef\]](#)
- Burns, James MacGregor. 1978. *Leadership*. New York: HarperCollins.
- Carlson, Stephen C. 2018. Buyer-seller communications: Trusted advisor constructs and measurement. *Atlantic Marketing Journal* 7: 33–48.
- Carradore, Marco. 2021. People's Attitudes towards the Use of Robots in the Social Services: A Multilevel Analysis Using Eurobarometer Data. *International Journal of Social Robotics*, 1–14. [\[CrossRef\]](#)
- Chin, Wynne W., Yong Jin Kim, and Gunhee Lee. 2013. Testing the Differential Impact of Structural Paths in PLS Analysis: A Bootstrapping Approach. *Springer Proceedings in Mathematics & Statistics* 56: 221–29. [\[CrossRef\]](#)
- Collin, Jari, Kari Hiekkanen, Janne J. Korhonen, Marco Halén, Timo Itälä, and Mika Helenius. 2015. *IT Leadership in Transition—The Impact of Digitalization on Finnish Organizations*. Aalto University Publication Series Science+Technology; Helsinki: Aalto University, vol. 7, p. 121.
- Contreras, Françoise, Elif Baykal, and Ghulam Abid. 2020. E-Leadership and Teleworking in Times of Covid-19 and beyond: What We Know and Where Do We Go. *Frontiers in Psychology* 11: 590271. [\[CrossRef\]](#)
- Copeland, Mary Kay. 2014. The Emerging Significance of Values Based Leadership: A Literature Review. *International Journal of Leadership Studies* 8: 105–35.
- Deloitte. 2021. Technology Futures: Projecting the Possible, Navigating What's Next, INSIGHT REPORT April 2021. (World Economic Forum). Available online: https://www3.weforum.org/docs/WEF_Technology_Futures_GTGS_2021.pdf (accessed on 7 April 2022).
- Drigas, Athanasios, and Maria Poulidou. 2013. E-Culture Techniques and Applications. *International Journal of Knowledge Society Research* 4: 11–17. [\[CrossRef\]](#)
- Durante, Regina. 2017. Value-Based Leadership and Personality Type. In *Encyclopedia of Strategic Leadership and Management*. Edited by Wang Viktor. Hershey: IGI Global, pp. 662–85. [\[CrossRef\]](#)
- Ejdys, Joanna. 2018. Building Technology Trust in ICT Application at a University. *International Journal of Emerging Markets* 13: 980–97. [\[CrossRef\]](#)
- Ejdys, Joanna, Alicja Gudanowska, Katarzyna Halicka, Anna Kononiu, Andrzej Magruk, Joanicjusz Nazarko, Lukasz Nazarko, Danuta Szpilko, and Urszula Wideliska. 2019. Foresight in higher education institutions: Evidence from Poland. *Foresight and STI Governance* 13: 77–89. [\[CrossRef\]](#)
- Eva, Nathan, Mulyadi Robin, Sen Sendjaya, Dirk van Dierendonck, and Robert C. Liden. 2019. Servant Leadership: A Systematic Review and Call for Future Research. *The Leadership Quarterly* 30: 111–32. [\[CrossRef\]](#)
- Filep, Roland. 2018. Vezetési Stílus Vizsgálata MLQ Segítségével a Szabolcs-Szatmár-Bereg Megyei Kisvállalkozások Körében. *International Journal of Engineering and Management Sciences* 3: 36–47. [\[CrossRef\]](#)
- Foerster-Metz, Ulrike Stefanie, Katrin Marquardt, Nina Golowko, Andreas Kompalla, and Christian Hell. 2018. Digital Transformation and its Implications on Organizational Behavior. *Journal of EU Research in Business* 2018: 340873. [\[CrossRef\]](#)

- Fornel, Claes, and David F. Larcker. 1981. Evaluation Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research* 18: 39–50. [CrossRef]
- Gandolfi, Franco, and Seth Stone. 2018. Leadership, Leadership Styles, and Servant Leadership. *Journal of Management Research* 18: 261–69.
- Gangel, Péter. 2019. Miért Hozunk (Üzleti) Döntéseket Idegenekben Bízva? *Forbes Magyarország*. April 11. Available online: <https://forbes.hu/legyel-jobb/bizalom-3-0-uzlet/> (accessed on 2 February 2022).
- Gardner, Williams L., Bruce J. Avolio, Fred Luthans, Douglas R. May, and Fred O. Walumbwa. 2005. “Can you see the real me?” A self-based model of authentic leader and follower development. *Leadership Quarterly* 16: 343–72. [CrossRef]
- Gfrerer, Anne, Katja Hutter, Johann Füller, and Thomas Ströhle. 2021. Ready or Not: Managers’ and Employees’ Different Perceptions of Digital Readiness. *California Management Review* 63: 23–48. [CrossRef]
- Gordon, Raymond D. 2008. Dispersed Leadership, Power and Change: An Empirical Study Using a Critical Management Framework. Paper presented at 22nd Australian and New Zealand Academy of Management Conference, Sidney, Australia, December 1–3; pp. 1–14.
- Haenlein, Michael, and Andreas M. Kaplan. 2004. A Beginner’s Guide to Partial Least Squares Analysis. *Understanding Statistics* 3: 283–97. [CrossRef]
- Hair, Joe F., Christian M. Ringle, and Marko Sarstedt. 2011. PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice* 19: 139–52. [CrossRef]
- Hair, Joseph F., Hult G. Tomas M., Christian M. Ringle, and Marko Sarstedt. 2022. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Los Angeles: SAGE.
- Hayduk, Leslie A., and Levente Littvay. 2012. Should Researchers Use Single Indicators, Best Indicators, or Multiple Indicators in Structural Equation Models? *BMC Medical Research Methodology* 12: 159. [CrossRef]
- Hunady, Jan, Jana Fendekova, and Marta Orviska. 2020. Attitudes and trust to recent digital technologies: Using standards to improve them. Paper presented at 25th EURAS Annual Standardisation Conference—Standards for Digital Transformation: Blockchain and Innovation, Glasgow, Scotland, June 10–12.
- i-SCOOP. 2016. Digital Transformation: Online Guide to Digital Transformation—i-SCOOP. Available online: www.i-scoop.eu/digital-transformation/ (accessed on 15 January 2022).
- Iten, Raphael, Joël Wagner, and Angela Zeier Röschmann. 2021. On the Identification, Evaluation and Treatment of Risks in Smart Homes: A Systematic Literature Review. *Risks* 9: 113. [CrossRef]
- Jackson, Brad, and Ken Parry. 2011. *A Very Short Fairly Interesting and Reasonably Cheap Book about Studying Leadership*. Los Angeles: SAGE.
- Jensen, Paul H., Alfons Palangkaraya, and Elizabeth Webster. 2015. Trust and the Market for Technology. *Research Policy* 44: 340–56. [CrossRef]
- Kakabadse, Nada. 2011. Leadership Teams: Developing and Sustaining High Performance. *Development and Learning in Organizations: An International Journal* 25. [CrossRef]
- Kane, C. Gerald, Doug Palmer, Anh N. Philips, David Kiron, and Natasha Buckley. 2015. Strategy, not technology, drives digital transformation. *MIT Sloan Management Review and Deloitte University Press* 14: 1–25.
- Kazár, Klára. 2014. A PLS-útelemzés és alkalmazása egy márkaközösség pszichológiai érzetének vizsgálatára. *Statistikai Szemle* 92: 33–52.
- Kezar, Adrianna, and Marissiko M. Wheaton. 2017. The Value of Connective Leadership: Benefiting from Women’s Approach to Leadership While Contending with Traditional Views. *About Campus: Enriching the Student Learning Experience* 21: 19–26. [CrossRef]
- Klaic, Anamarija, Michael Josef Burtscher, and Klaus Jonas. 2020. Fostering Team Innovation and Learning by Means of Team-Centric Transformational Leadership: The Role of Teamwork Quality. *Journal of Occupational and Organizational Psychology* 93: 942–66. [CrossRef]
- Klein, Müge. 2020. Leadership Characteristics in the Era of Digital Transformation. *Business & Management Studies: An International Journal* 8: 883–902. [CrossRef]
- Kouni, Zacharo, Marios Koutsoukos, and Dimitra Panta. 2018. Transformational leadership and job satisfaction: The case of secondary education teachers in Greece. *Journal of Education and Training Studies* 6: 158–68. [CrossRef]
- KSH. 2021. Összefoglaló táblák (STADAT)—Évközi adatok—Gazdasági társaságok és nonprofit szervezetek. Available online: https://www.ksh.hu/stadat_evkozi_3_2 (accessed on 8 April 2022).
- Levine, Kenneth J. 2007. Trait Theory. In *Leadership: The Key Concepts*. Edited by Marturano Antonio and Jonathan Gosling. London: Routledge, pp. 163–66. [CrossRef]
- Lipman-Blumen, Jean. 2017. Connective Leadership in an Interdependent and Diverse World. *Roeper Review* 39: 170–73. [CrossRef]
- Llopis, Juan, M. Reyes Gonzalez, and Jose L. Gasco. 2004. Transforming the Firm for the Digital Era: An Organizational Effort towards an E-Culture. *Human Systems Management* 23: 213–25. [CrossRef]
- Mack, Oliver, and Anshuman Khare. 2016. Perspectives on a VUCA World. In *Managing in a VUCA World*. Edited by Mack Oliver, Anshuman Khare, Andreas Krämer and Thomas Burgatz. Cham: Springer, pp. 3–19. [CrossRef]

- Martin, Jean-François. 2018. Unlocking Success in Digital Transformations, McKinsey & Company. Available online: <https://www.mckinsey.com/~{}//media/mckinsey/business%20functions/people%20and%20organizational%20performance/our%20insights/unlocking%20success%20in%20digital%20transformations/unlocking-success-in-digital-transformations.pdf?shouldIndex=false> (accessed on 7 April 2022).
- Martínez-Caro, Eva, Juan Gabriel Cegarra-Navarro, and Francisco Javier Alfonso-Ruiz. 2020. Digital Technologies and Firm Performance: The Role of Digital Organizational Culture. *Technological Forecasting and Social Change* 154: 119962. [CrossRef]
- Maziero, Vanessa Gomes, Andrea Bernardes, Eline Aparecida Righetti, Wilza Carla Spiri, and Carmen Silvia Gabriel. 2020. Positive Aspects of Authentic Leadership in Nursing Work: Integrative Review. *Revista Brasileira de Enfermagem* 73: e20190118. [CrossRef] [PubMed]
- Nemeth, Krisztian. 2018. Miért gond az, ha az emberek nem értik, hogyan működik a technológia? Available online: <http://blog.webshark.hu/2018/10/17/technologiai-mitoszok/> (accessed on 7 April 2022).
- Nichols, Austin Lee. 2016. What Do People Desire in Their Leaders? The Effect of Leadership Experience on Desired Leadership Traits. *Leadership & Organization Development Journal* 37: 658–71. [CrossRef]
- Northouse, Peter Guy. 2007. *Leadership: Theory and Practice*. Thousand Oaks: SAGE.
- O'Toole, Laurence J. 1995. Rational Choice and Policy Implementation: Implications for Interorganizational Network Management. *The American Review of Public Administration* 25: 43–57. [CrossRef]
- Özbağ, Gönül Kaya. 2016. The Role of Personality in Leadership: Five Factor Personality Traits and Ethical Leadership. *Procedia—Social and Behavioral Sciences* 235: 235–42. [CrossRef]
- Ozlati, Shabnam. 2012. Motivation, Trust, Leadership, and Technology: Predictors of Knowledge Sharing Behavior in the Workplace. Ph.D. dissertation, Claremont Graduate University, Claremont, CA, USA. [CrossRef]
- Parra-Cardona, Rubén, Patty Leijten, Jamie M. Lachman, Anilena Mejía, Ana A. Baumann, Nancy G. Amador Buenabad, Lucie Cluver, Jenny Doubt, Frances Gardner, Judy Hutchings, and et al. 2021. Strengthening a Culture of Prevention in Low- and Middle-Income Countries: Balancing Scientific Expectations and Contextual Realities. *Prevention Science* 22: 7–17. [CrossRef]
- Paul, Samuel. 2019. *Managing Development Programs: The Lessons of Success*. New York: Routledge. [CrossRef]
- Pioli, Barla L., Simone G. Feuerschütte, Rafael Tezza, and Éverton L. Cancellier. 2020. Authentic Leadership: Scientific Production Analysis and Measurement Scales. *RAM Revista de Administração Mackenzie* 21: 1–29. [CrossRef]
- Ragulina, Julia V., Vladimir F. Ukolov, and Oleg V. Shabunovich. 2021. Adaptation to the Risks of Digitalization: New Survival Trends for States in a Multipolar World. *Risks* 9: 218. [CrossRef]
- Ringle, Christian M., Sven Wende, and Jan-Michael Becker. 2015. *SmartPLS 3*. Boenningstedt: SmartPLS GmbH, Available online: <http://www.smartpls.com> (accessed on 2 February 2022).
- Rogers, David L. 2016. *The Digital Transformation Playbook: Rethink Your Business for the Digital Age*. New York: Columbia Business School Pub.
- Romero, David, Paolo Gaiardelli, Thorsten Wuest, Daryl Powell, and Matthias Thürer. 2020. New Forms of Gemba Walks and Their Digital Tools in the Digital Lean Manufacturing World. In *Advances in Production Management Systems. Towards Smart and Digital Manufacturing*. Cham: Springer, pp. 432–40. [CrossRef]
- Ross, Jeanne. 2019. How Digital Changes the Role of Leaders? MITSloan Management Review. Available online: <https://sloanreview.mit.edu/audio/how-digital-changes-the-role-of-leaders/> (accessed on 7 April 2022).
- Salam, Mohammad Asif. 2017. The Mediating Role of Supply Chain Collaboration on the Relationship between Technology, Trust and Operational Performance. *Benchmarking: An International Journal* 24: 298–317. [CrossRef]
- Schein, Edgar H. 2010. *Organizational Culture and Leadership*, 4th ed. San Francisco: Jossey Bass.
- Shahzad, Khurram, Usman Raja, and Syed Danial Hashmi. 2021. Impact of Big Five Personality Traits on Authentic Leadership. *Leadership & Organization Development Journal* 42: 208–18. [CrossRef]
- Sia, Siew Kien, Christina Soh, and Peter Weill. 2016. How DBS Bank Pursued a Digital Business Strategy. *MIS Quarterly Executive* 15: 105–21.
- Siau, Keng, and Weiyu Wang. 2018. Building trust in artificial intelligence, machine learning, and robotics. *Cutter Business Technology Journal* 31: 47–53.
- Soliman, Amal F. 2020. The effect of leadership empowerment on technology transfer effectiveness: A proposed model: An applied study on the telecommunication companies in one of the developing countries. *The Journal of High Technology Management Research* 31: 100371. [CrossRef]
- Soomro, Mansoor Ahmed, Mohd Hizam-Hanafiah, and Nor Liza Abdullah. 2020. Digital readiness models: A systematic literature review. *Compusoft An International Journal of Advanced Computer Technology* 9: 3596–605.
- T. Nagy, Judit, and Maria Bernschütz. 2017. Nemek közötti különbségek a technológia elfogadásában—A PLS-MGA alkalmazása. *Statisztikai Szemle* 95: 51–77. [CrossRef]
- Van Laar, Ester, Alexander J. A. M. van Deursen, Jan A. G. M. van Dijk, and Jos de Haan. 2018. 21st-Century Digital Skills Instrument Aimed at Working Professionals: Conceptual Development and Empirical Validation. *Telematics and Informatics* 35: 2184–200. [CrossRef]
- Verhoef, Peter C., Thijs Broekhuizen, Yakov Bart, Abhi Bhattacharya, John Qi Dong, Nicolai Fabian, and Michael Haenlein. 2021. Digital Transformation: A Multidisciplinary Reflection and Research Agenda. *Journal of Business Research* 122: 889–901. [CrossRef]

- Walumbwa, Fred O., Bruce J. Avolio, William L. Gardner, Tara S. Wernsing, and Suzanne J. Peterson. 2008. Authentic Leadership: Development and Validation of a Theory-Based Measure. *Journal of Management* 34: 89–126. [CrossRef]
- Wang, Viktor X., and Geraldine Torrisi-Steele. 2017. Digital Leadership in the New Century. In *Encyclopedia of Strategic Leadership and Management*. Edited by Wang Viktor. Hershey: IGI Global, pp. 143–59. [CrossRef]
- Westerman, George. 2019. The First Law of Digital Innovation. *MIT Sloan Management Review*. Available online: <https://sloanreview.mit.edu/article/the-first-law-of-digital-innovation/> (accessed on 7 April 2022).
- Westerman, George, Mael Tannou, Didier Bonnet, Patrick Ferraris, and Andrew McAfee. 2012. The Digital Advantage: How digital leaders outperform their peers in every industry. *MIT Sloan Management and Capgemini Consulting* 2: 2–23.
- Xu, Jie, Kim Le, Annika Deitermann, and Enid Montague. 2014. How Different Types of Users Develop Trust in Technology: A Qualitative Analysis of the Antecedents of Active and Passive User Trust in a Shared Technology. *Applied Ergonomics* 45: 1495–503. [CrossRef]
- Yukl, Gary A. 2013. *Leadership in Organizations*. Harlow: Pearson.