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THE IMPACT OF DIGITALIZATION ON FUTURE LEADERS SKILLS

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Introduction: Digitization has revolutionized various aspects of business and society, presenting new challenges and opportunities for leaders in the digital era. This paper examines the impact of digitization on leadership traits and skills and identifies the most significant changes that have occurred in the face of new societal challenges.

Methodology: A literature review and a survey were conducted to determine the qualities and skills of future leaders in the digital age. The study focused on the most evident changes caused by digitization, such as knowledge sharing, innovation, cooperation, networking, and communication.

Results: The study finds that future leaders must possess adaptability, vision, empowerment, collaboration, digital literacy, data-driven decision-making, agile thinking, design thinking, ethical awareness, and emotional intelligence. The findings suggest that future leaders must adapt to the changes brought by digitization and incorporate new skills and traits to be effective in the digital world.

Discussion: Leadership theories of the past no longer fully reflect the skills and abilities that leaders require in the modern age. The digital age has brought a new approach to leadership, and digitization has significantly shaped this new image. To be an effective leader today, one must embrace digitization and continuously develop new skills to stay ahead of the curve. The following has increased the need for continuous skills improvement through formal and informal education.

Conclusion: The research showed that digitization has a significant impact on knowledge sharing, innovation, collaboration, networking, and communication. It has a minor effect on trust and efficiency. Leaders of the 21st century should adapt to continuous changes and involve all employees in decision-making and task execution to optimize their performance.

Keywords: *digitalization, leadership, leadership characteristics, leadership skills.*

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1 Introduction

Digitization is transforming various aspects of contemporary society and profoundly impacts leadership practices. The rapid development of digital technologies has created new opportunities and challenges for leaders to adapt and incorporate new skills and traits. Cortellazzo et al. (2019) state in their article "The Role of Leadership in a Digitalized World" that leaders are crucial to developing a digital culture. Klein (2020) argues that so-called digital leaders are expected to act quickly and flexibly in networked and distributed organization structures while managing digital transformation. According to Maheshwari & Yadav (2020), traditional leadership models may not adequately prepare our future leaders for the digital age. This article explores how digitization has changed the characteristics and skills of future leaders and how leadership theories from the past can be modified or extended to address the challenges and opportunities of digitization. The paper examines the impact of digitization on leadership styles, processes, organizations, and business domains and how leaders must adapt and change with their employees. Leadership is a process whereby one person influences others or a person to attain his personal goal that aligns with the organization's objectives. Leaders enact the leadership process in the organization by utilizing their knowledge and leadership skills. Knowledge and skills directly affect the leadership process, while other attributes confer the leader with distinctive characteristics. The study finds that future leaders must possess adaptability, vision, empowerment, collaboration, digital literacy, data-driven decision-making, agile thinking, design thinking, ethical awareness, Internet of things and emotional intelligence. The findings suggest that future leaders must adapt to the changes brought by digitization and incorporate new skills and traits to be effective in the digital world.

2 Literature review

Digitization is a phenomenon that has transformed various aspects of business and society. It has also posed new challenges and opportunities for leaders and their leadership skills in the digital era. In his article "Leadership in the digital age: A Study of the Effects of Digitalization on top management leadership," Khan (2016) argues that digitalization rapidly and profoundly alters existing businesses and organizations. Digitization and digital transformation are two related but distinct concepts that have implications for society and business in the short and long term. Digitization converts analogue data, such as images, videos, and text, into digital form. Digital transformation is applying digital technology to various aspects of human society. Digitization enables the creation of digital variants of existing products or services, which offer advantages over their physical counterparts. Digitalization is the adoption or increase of digital or computer technology by an organization, industry, country, etc., which may result in changes in work methods, roles, and business models. Digitalization in business is considered one of the most influential business and technological trends that will shape business and society in the future. The transition from analogue to digital data forms is known as digitization, which entails the application of digital technology across various aspects of contemporary society. Digitization also denotes the adoption or enhancement of digital or computer technology by an individual, organization, industry, etc. In addition, it involves transforming work methods and roles due to the use of digital technologies in an organization or its operating environment.

Therefore, it is essential to examine the context and the impact of digitalization on the qualities and skills of future leaders. This paper looks at how digitization has changed the traits and skills of future leaders and how leadership theories from the past can be used and changed to fit the digital world. Klus & Müller (2020) attempted to determine the Leadership Skills Required in the Digital Age and discovered that the evolution of digital technologies significantly alters organizational working environments and creates new challenges for executives. Brynjolfsson and McAfee (2014) emphasize that digitization changes information into digital formats that can be stored, processed, sent, and accessed by electronic devices. Digitization has allowed information and communication technologies (ICTs) like the internet, cell phones, social media, cloud computing, artificial intelligence, big data, and blockchain to develop quickly and spread quickly. These technologies have made creating, sharing, and analyzing large amounts of data easier across different locations and time zones (Bharadwaj et al., 2013). This has increased the speed, efficiency, and creativity of business processes. Digitization has also helped globalization grow. Globalization is the process of countries, markets, cultures, and people becoming more interconnected and dependent on each other (Benton-Short et al., 2005). Hitt et al. (2017) say globalization has complicated and diversified the business world. It has also made it harder for organizations and stakeholders to work together and compete. In this situation, their followers, customers, partners, competitors, regulators, and society will have new needs and expectations of them. Avolio et al. (2014) say that future leaders must develop four main traits: the ability to adapt, a clear vision, the power to make decisions, and the ability to work with others. Adaptability refers to the ability to cope with uncertainty and change and to learn from feedback and experience. Vision refers to creating and communicating the organization's clear direction and purpose. Giving followers power and responsibility and encouraging their independence and creativity is what it means to empower them. Lastly, collaboration means building trust and relationships with different groups of people and using their knowledge and resources. In addition to these traits, future leaders must also learn essential skills in the digital world. According to Cappelli et al. (2020), these skills include digital literacy, data-driven decision-making, agile thinking, design thinking, ethical awareness, and emotional intelligence. Digital literacy refers to using ICTs effectively and appropriately for various purposes. Gathering, analyzing, interpreting, and using data to solve problems and come up with new ideas is what is meant by "data-driven decision-making." Agile thinking means trying out new ideas and methods and making changes quickly based on feedback. Design thinking refers to empathizing with users' needs and wants and creating user-centric solutions. Ethical awareness means seeing and dealing with ethical problems and social responsibilities in the digital world. Human-to-human communication is the Internet's primary mode of communication. The Internet of Things (IoT) is becoming the emerging form of communication that utilizes the Internet as its underlying technology (Chopra et al., 2019). Verma et al. (2022) believe leaders should emphasize a digital culture by providing high autonomy, collaboration, virtual space, and empowerment. Finally, emotional intelligence refers to the ability to understand and manage one's emotions and those of others. These traits and skills are not entirely new or unique to future leaders. Instead, they are extensions or improvements of leadership skills that different leadership theories have already found. For example, transformational leadership theory (Bass & Riggio, 2006) discusses how important vision, empowerment, and emotional intelligence are for getting people to commit and do their best. In addition, Sander, P. (2020) states that transformational leadership is the most appropriate leadership style in digital transformation and multigenerational workforces.

Fiedler's (1967) theory of "contingency leadership" shows how important it is to change your leadership style to fit different situations. Gronn's (2002) distributed leadership theory emphasizes the importance of working together to share leadership roles and tasks among many people. However, these theories must also be changed or added to consider digitization's unique problems and benefits. For example, transformational leadership theory might need to consider how digital platforms and tools can improve communication and motivation. Situational factors that need to be added to the contingency leadership theory are being ready for digital changes and having a solid culture. Distributed leadership might need to discuss coordinating and combining skills and information from different places. This study examines the fundamental skills necessary for effective leadership, including technical, interpersonal, and conceptual abilities.

3 Methodology

This study aimed to explore students' perceptions of how digitization affects the traits and skills of future leaders. In December 2022, 41 students at the University of Split's University Department for Professional Studies taking a graduate-level Leadership course participated in the study. The students were both full-time and part-time and had different work experience levels. The study used a mixed-methods approach, combining a workshop and a questionnaire survey. The workshop was conducted before the questionnaire to elicit students' views and knowledge. The questionnaire consisted of two parts: the first part was about the respondents' socio-demographic characteristics, and the second part contained questions on the impact of digitization on various aspects of leadership. In addition, the study aimed to answer the following research questions: What are students' experiences and knowledge related to leadership in digitization? Which areas of leadership are most and least affected by digitization, according to students? How do students evaluate the characteristics and skills of future leaders in the digital age?

Given that the research design is primarily qualitative, i.e., to elicit insights into the perceptions and experiences of the accessible participants, the subsequent data analysis will be confined to identifying those observations that could inform further inquiry on leadership and digitization.

3.1 Data analysis

To analyze open-ended survey data, the authors used thematic analysis. The purpose of thematic analysis is to recognize patterns and themes in the responses to open-ended queries. The data were coded, similar codes were grouped into categories, and overarching themes were identified. Each open-ended response was read and analyzed to determine meaningful text units before coding. A code was assigned to the units, representing a label or category that encapsulates the essence of the response. Following the completion of the coding procedure, comparable codes were categorized. These categories were significant and pertinent to the research question. For instance, categories included "Managing Information Overload" and "Adapting to Rapid Technological Change" in response to the research question "What are the main challenges faced by leaders in the digital era?"

3.2 Results

A total of 21 respondents were in the age group of 18-24, and 20 respondents in the age group of 25-34 participated in the research. There was a total of 20 female respondents and 21 male respondents. The largest share of respondents was employed full-time and part-time, while the remaining were unemployed. Respondents with work experience mainly were interns (6), followed by individual contributors (4), lower-level managers (2), owners (2), and the largest share of respondents answered that they did something else (8), i.e., none of the above (13). The main findings of the study were as follows: Regarding the anticipated changes in leadership practice in the future (20 years hence), the participants envisioned the following novel role of a leader: a leader as a mentor for data and information whose work is much more rapid, engaging and increasingly reliant on virtual channels. Concurrently, participants opined that such a novel role would entail leadership practices that would be more customized and facile to implement. Moreover, participants remarked that empathy and the capacity to motivate would persist as very salient and that many managerial tasks will be delegated to subordinates. When queried about which facets of leadership practice will be most impacted by digitization in the future, participants indicated knowledge sharing, communication, and innovation, underscoring how digitization will enhance these practices through greater efficacy. Almost all students pointed out that the Internet of Things will play one of the most critical roles in developing leaders of the 21st century. Only a few participants endorsed digitalization to augment trust in leaders or to amplify the extant power of leaders. Trust was rated as the facet of leadership least influenced by digitalization. When participants were invited to elaborate more on the opportunities that digitization will offer to leadership practice, they concentrated on efficiency and flexibility of choice of location/time/channel. Respondents commented that, according to their experience so far, digitization has only increased their workload. They mentioned they had to deal with more information, tasks, and expectations from different stakeholders. They also had to learn new skills and adapt to changing environments and technologies. Respondents also commented that leaders face new challenges and tasks requiring continuous knowledge investment and openness to change. They found that leaders in the digital age must be creative, develop new ideas, work together, communicate, have a clear vision, and think strategically. Only two respondents stated that introducing digitization in their workplaces brought negative changes. The only fears mentioned by such respondents are those related to privacy and the possibility of misuse and theft of personal and business data. They expressed concern about the security and ethical issues that digitization may entail. At the same time, most respondents said positively that digitization makes it easier for them to study and work and enables holding virtual meetings, saving them time and money. They also appreciated the benefits of digitization for learning and development, such as access to diverse and updated sources of information, feedback, and mentoring. Based on the reflections highlighted above, the respondents seem realistic about digitalization and its future impact on leadership practice. The general conclusion about the respondents' views could be summarized as follows: digitalization will bring opportunities and challenges to leadership practices and improve leadership tools towards greater effectiveness. At the same time, it is important to keep putting money into communication, building networks, and getting and sharing knowledge so that

leadership stays human. Overall, the workshop and survey questionnaire presented several valuable and innovative proposals on how digitization could affect current and future leaders and their leadership practices. Although these ideas may be difficult to systematize, they nevertheless indicate a possible change in the thinking of future leaders: an increase in awareness of future leadership trends and a willingness to participate in leadership studies. Table 1 provides the essential leadership skills adopted from Katz (1974). Students have identified the bolded terms as the most significant for future leaders.

Table 1 The basic leadership skills

Technical skills	Human skills	Conceptual skills
Programming languages	Communication skills	Strategic thinking
Web development	Teamwork and collaboration	Visioning
Data analysis and visualisation	Leadership and management	Creative thinking
Database management	Conflict resolution	Problem-solving
Networking and security	Emotional intelligence	Systems thinking
Cloud computing	Active listening	Analytical thinking
Artificial intelligence and machine learning	Time management	Innovation
Internet of Things (IoT)	Decision-making	Decision-making
Mobile development	Negotiation skills	Critical thinking
Technical writing and documentation	Adaptability and flexibility	Adaptability and flexibility
Graphic design and video editing	Cultural awareness and sensitivity	Forecasting
Operating systems and software applications	Problem-solving	Conceptualizing
Electrical and mechanical engineering	Customer service.	Entrepreneurial thinking
Robotics and automation	Creativity and innovation	Strategic planning developing
Quality control and testing		
Project management tools and methodologies		
Analytical and problem-solving skills		
Research and development		
Mathematics and statistical analysis		
Digital marketing and social media management.		
In bold: Skills and traits identified as relevant for the future leadership		

Source: Adopted from Katz (1974).

Future leaders must possess a combination of technical, interpersonal, and conceptual skills to be successful. Technical skills such as programming languages, data analysis, networking, and artificial intelligence are required to administer complex technological systems. Human abilities such as communication, teamwork, emotional intelligence, and cultural awareness are essential for effective leadership and management. Conceptual skills such as strategic thinking, creative thinking, problem-solving, systems thinking, and entrepreneurial thinking are essential for developing new ideas and approaches to addressing business challenges. Future leaders must possess these skills and traits to navigate the swiftly evolving technological and business landscape.

3.3 Research Limitations

This study has several limitations which need to be acknowledged. First, the sample size was comparatively small, and responses were restricted to single university students. This could limit the generalizability of the findings. Second, the study's emphasis on students' perceptions may not necessarily reflect the perspectives and experiences of current leaders in the field. Thirdly, the study employed mixed methods, which may have limited the profundity of analysis of the free-text responses. The study did not include the influence of cultural and contextual factors on students' perceptions of digital leadership.

3.4 Discussion

The findings of this study indicate that digitization has a substantial effect on leadership qualities and abilities. Students identified several obstacles leaders face in the digital age, including managing information inundation and adapting to rapid technological change. Students also emphasized the significance of digital literacy, creativity, and adaptability for future leaders. The study findings have implications for leadership development programs, which may need to incorporate more training in digital literacy and technological skills. This study's limitations suggest avenues for future research, such as investigating the experiences and perceptions of practising leaders in various industries and contexts. Furthermore, the study provides valuable insights into the impact of digitization on leadership and identifies areas needing further research and development.

4 Conclusion

The research revealed that digitization's influence at the respondent's current workplace or school was most evident in knowledge sharing, innovation, collaboration, networking, and communication. Respondents opined that digitization had a minor effect on trust and efficiency. Also, the research shows that the respondents are aware of the changes that digitization has brought to their work and study. Leaders of the 21st century should exhibit different characteristics and skills than leaders throughout history. Digitization has profoundly impacted the changes in leaders because they need to respond swiftly in today's dynamic business environment. After all, business processes are constantly evolving. Therefore, leaders should be cognizant of continuous changes and adapt to them, and in this process, they

should involve all employees. Thus, the leadership of the 21st century emphasizes leadership styles that foster employee participation and autonomy in decision-making and task execution to optimize and enhance their performance.

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Sažetak

UTJECAJ DIGITALIZACIJE NA VJEŠTINE BUDUĆIH VOĐA

Uvod: Digitalizacija je revolucionizirala različite aspekte poslovanja i društva, postavljajući nove izazove i prilike za vođe digitalnog doba. Ovaj rad istražuje utjecaj digitalizacije na osobine i vještine vođa te identificira najznačajnije promjene koje su se dogodile uslijed novih društvenih izazova.

Metodologija: U radu je analizirana relevantna literatura te je provedeno istraživanje kako bi se utvrdile kvalitete i vještine budućih vođa digitalnog doba. Studija se usredotočila na najočitije promjene uzrokovane digitalizacijom, poput dijeljenja znanja, inovacija, suradnje, umrežavanja i komunikacije.

Rezultati: Istraživanje je pokazalo kako buduće vođe moraju posjedovati prilagodljivosti, viziju, osnaživanje, suradnju, digitalnu pismenost, donošenje odluka na temelju podataka, agilno razmišljanje, stvaralačko mišljenje, etičku osviještenost te emocionalnu inteligenciju. Rezultati sugeriraju da se buduće vođe moraju prilagoditi promjenama koje donosi digitalizacija i uključiti nove vještine i osobine kako bi bili učinkoviti u digitalnom svijetu.

Rasprava: Ranije teorije vodstva nisu odražavale u potpunosti vještine i sposobnosti koje trebaju imati vođe modernog doba. Digitalno doba donosi novi pristup vodstvu, a digitalizacija je značajno oblikovala tu novu sliku. Da bi danas bio učinkovit, vođa treba prihvatiti digitalizaciju i neprestano razvijati nove vještine kako bi ostao ispred konkurencije. To je povećalo potrebu za kontinuiranim poboljšanjem vještina putem formalnog i neformalnog obrazovanja.

Zaključak: Istraživanje je pokazalo kako digitalizacija ima značajan utjecaj na dijeljenje znanja, inovacije, suradnju, umrežavanje i komunikaciju, te manji utjecaj na povjerenje i učinkovitost. Vođe 21. stoljeća trebaju se prilagoditi neprestanim promjenama i uključiti sve zaposlenike u donošenje odluka i izvršavanje zadataka, kako bi optimizirali svoje performanse.

Ključne riječi: digitalizacija, vodstvo, obilježja vodstva, vještine vođe.

APPENDIX 1:

The survey:

1. Your age group:

- 18 – 24
- 25 – 34
- 35 – 44
- 45 – 45
- 46 – and more

2. Your gender:

- female
- male

3. Which of the following categories best describes your current work status:

- employed full-time.
- employed part-time.
- unemployed, looking for a job.
- unemployed, not looking for a job.
- unable to work.
- other

4. Choose your position at work:

- individual contributor
- team leader
- lower-ranking manager
- middle manager
- senior manager
- partner
- the owner
- volunteer
- intern
- something else
- none of the above

5. How would you describe your leadership experience so far?

- I am a very experienced leader.
- my leadership experience is relatively scarce.
- I am new to the field of leadership.
- I have no leadership experience.
- something else

6. How do you think leadership will change the digitalization of society in the next 20 years?

7. Which leadership characteristics/skills will be desirable, and which will be obsolete?

8. Please share with us what you're thinking regarding the future of leadership

9. Please mark the impact of digitalization on the following aspects of leadership:

	1 – does not influence at all	2	3	4	5 – has an extraordinary impact
communication					
networking					
team work					
efficiency					
effectiveness					
productivity					
innovation					
power					
trust					
knowledge					
knowledge sharing					

10. What challenges does digitization pose to leaders?

11. What is the impact of digitization at your current place of work/study?

12. What will digitization impact your workplace/study in the future?

13. How will leaders prepare for digitization?

14. How will digitization affect the relationship between leaders and followers?

15. Please choose three key things to be an effective digital leader.

16. Please select three critical practices for a successful digital leader.

17. Please list three essential leadership skills in a digitalized work environment.

18. How can leaders create and maintain trust in the digital world?

19. How can digitalization help leaders achieve better results at work?

20. Can digitization influence the creation of a strategy? Why? How?

