

Transforming Leadership for the Digital Era: Embracing Collaboration and Technological Proficiency

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ABSTRACT

This review highlights a significant transformation in leadership paradigms prompted by the digital era. Traditional hierarchical structures are increasingly being replaced by decentralized and collaborative models, empowering employees to contribute valuable insights and data. Digital leadership is now characterized by collaboration, transparency, and shared decision-making, with leaders acting as facilitators of collective intelligence. Essential to this role is digital acumen, which encompasses a deep understanding of digital technologies and their strategic implications, including competence in cybersecurity, risk management, and staying abreast of technological trends. Innovation stands as a cornerstone of digital leadership, with leaders fostering environments that promote idea-sharing and risk-taking. By leveraging advanced technologies such as artificial intelligence (AI) and cloud computing, organizations can significantly enhance customer experiences and achieve operational excellence. This study underscores the challenges and opportunities presented by the shift towards a more agile, innovative, and resilient leadership landscape in the digital age.

Keywords- Digital revolution, Transformation, Digital Leadership, Digital Strategy.

Introduction:

Traditionally, leadership was frequently considered equivalent to authority and the hierarchical allocation of power inside enterprises. Leaders possessed decision-making autonomy, while employees adhered to directions with minimal involvement. Nevertheless, the traditional leadership paradigm, which is based on a hierarchical approach, is seeing a significant transformation in the era of digital technology. The literature indicates that the advent of the digital era necessitates a leadership style that is more collaborative and inclusive. This section of the thesis provides a concise summary of the systematic literature reviews that were undertaken on the different concerns. This approach facilitated the understanding of the significant contributions made by various renowned scholars and researchers from around the world in the development of this concept. Furthermore, this process not only helped identify areas where research is lacking, but also supplied crucial data for formulating suitable study questions and objectives. The literature review also facilitated the identification of barriers to DL implementation, which aided in the development of questionnaires for collecting quantitative data.

The Evolution of Leadership in the Digital Age

Leadership in the digital era pertains to the ability to lead a firm or industry throughout the shift towards a society that is rich in information. This concept was introduced by Goethals et al. in 2002, prior to the emergence of Industry 4.0. Digital leadership pertains to the act of leading and guiding a company or industry in the context of the digital era. Conversely, "digital leadership" pertains to leadership within the key sectors of the information society, such as media, journalism, and communication. Despite their significant differences, both leadership philosophies leverage the basic ICT sectors to establish connections between clients and vendors. Hence, it is imperative for leaders in many domains such as healthcare, arts, and production to possess a comprehensive understanding of the novel possibilities and limitations presented by Information and Communication Technologies (ICTs) and effectively utilise them (Goethals et al.,

2002). Toduk claims that a new period commenced after 2013, and he argues that the term "digital" now represents this era. As a result, the traditional principles of leadership are undergoing a transformation. Hence, the forthcoming search for leadership will prioritise qualities such as innovative thinking, proficiency in digital technologies, extensive networks, collaborative abilities, inclusive involvement, and visionary outlook. (Toduk, 2014).

In the current era of digitalization, leadership has experienced a significant shift, which has posed a challenge to conventional hierarchical and authoritative approaches. The change mentioned here is propelled by the combination of enduring leadership attributes with a fresh digital expertise that is essential for successfully navigating the intricacies of the contemporary corporate environment. Digital leadership diverges from the conventional paradigm and prioritises cooperation, agility, and a profound comprehension of digital technologies. With the growing reliance of companies on technology for innovation, efficiency enhancement, and customer engagement, leaders must adapt to meet these emerging requirements (Abbu et al., 2020). An important part of this development is the increased responsibility of leaders in promoting innovation. In the era of digital technology, innovation is not solely the duty of a specialised research and development team; rather, it should be a philosophy that influences every aspect of the organisation. Forward-thinking individuals in positions of digital leadership understand that the ability to innovate is crucial in order to maintain competitiveness and effectively meet the constantly changing demands of customers. They establish conditions that foster innovation, experimentation, and the willingness to take risks. (Li, Charlene et al., 2017) In addition, digital leadership necessitates a profound dedication to strategic thinking inside a digital framework. Leaders must possess a comprehensive understanding of how digital technology can be utilised to accomplish not only broad aims and objectives, but also to reach them. Visionary leaders create a distinct digital plan that is in line with the overall business strategy, guaranteeing that technology expenditures contribute to long-term achievements. Exhibiting leadership during periods of uncertainty is another distinguishing characteristic of digital leadership.

The digital realm is defined by swift transformation, disturbance, and uncertainty. Prominent digital leaders welcome uncertainty as a chance for growth rather than a danger. They possess the ability to make well-judged choices using limited knowledge, engage in calculated risks, and swiftly adjust to changing situations (Sinek, Simon et al., 2014). There are numerous challenges in adjusting to this new environment. Numerous executives encounter a significant challenge in comprehending and effectively utilising digital technologies. In addition, there is frequently a reluctance to change, as staff may need to be more receptive to adopting new technologies or working practices. Effective digital leaders tackle these obstacles by continuously educating themselves, maintaining open and clear communication, and dedicating themselves to fostering a culture of digital proficiency. The emergence of leadership in the digital era is a direct result of the profound impact of technology. In order to succeed in this new century, leaders must wholeheartedly embrace teamwork, agility, and digital expertise. They have a crucial role in promoting innovation, leading organisations through digital transitions, and making strategic decisions that position their companies for success. (Senge, Peter et al., 1990)

The Role of Digital Acumen in Modern Leadership

In order to keep up with the fast-paced changes in the digital landscape, it is crucial for executives to have a profound understanding of digital technologies and how they affect business operations and strategy. Historically, leadership may have necessitated a greater level of technological expertise. Leaders typically prioritise strategic decision-making, organisational management, and interpersonal skills. Nevertheless, digital technologies have transformed the standards and requirements for effective leadership (Brynjolfsson, Erik et al., 2014).

Digital acumen refers to a wide range of skills and expertise that are associated with digital technology, data analytics, cybersecurity, and upcoming developments like artificial intelligence and the Internet of Things. To effectively steer their businesses, digital leaders are required to possess extensive knowledge in these domains and make well-informed decisions. An essential component of digital expertise is utilising technology to gain a competitive edge. Digitally proficient individuals comprehend the ways in which digital technologies can optimise procedures, elevate client interactions, and stimulate innovation. They proactively pursue chances to incorporate technology into different aspects of their organisations, including marketing, sales, supply chain management, and customer support. (Hamel, Gary et al., 2020)

In addition, digital aptitude requires keeping up-to-date with developing technology and trends. Effective digital executives dedicate time to ongoing learning and closely monitor the digital ecosystem in order to detect emerging opportunities and potential disruptors.

They actively participate in continuous education, participate in industry conferences, and work with field specialists to remain well-informed and inventive. Leaders that possess a strong understanding and proficiency in digital technologies are more capable of effectively managing the challenges of the digital era, leading efforts

to change their organisations digitally, and positioning their organisations for success in a fiercely competitive and fast changing digital environment (Li, Charlene et al., 2017)..

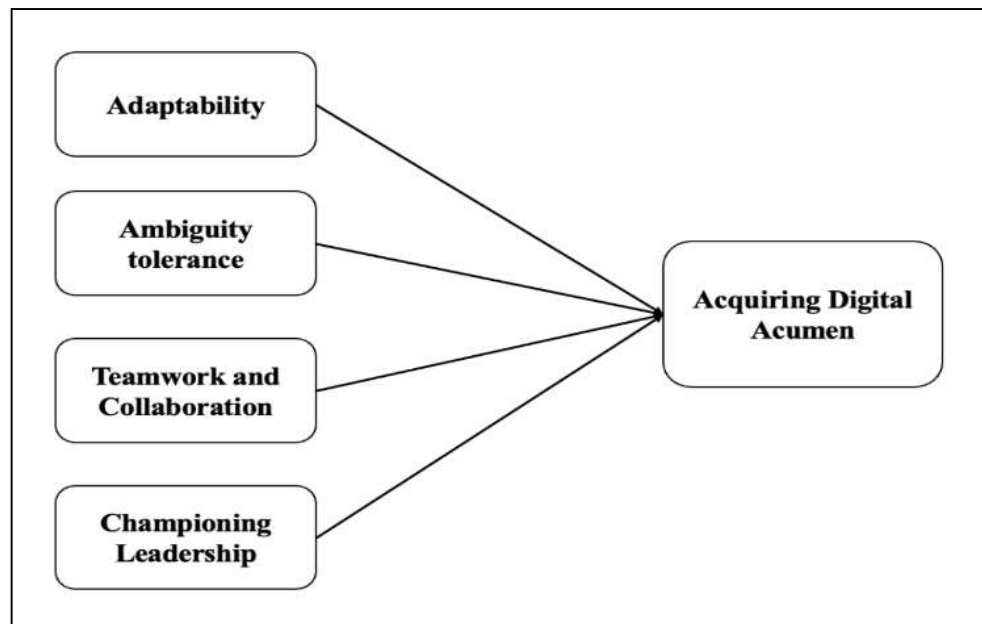


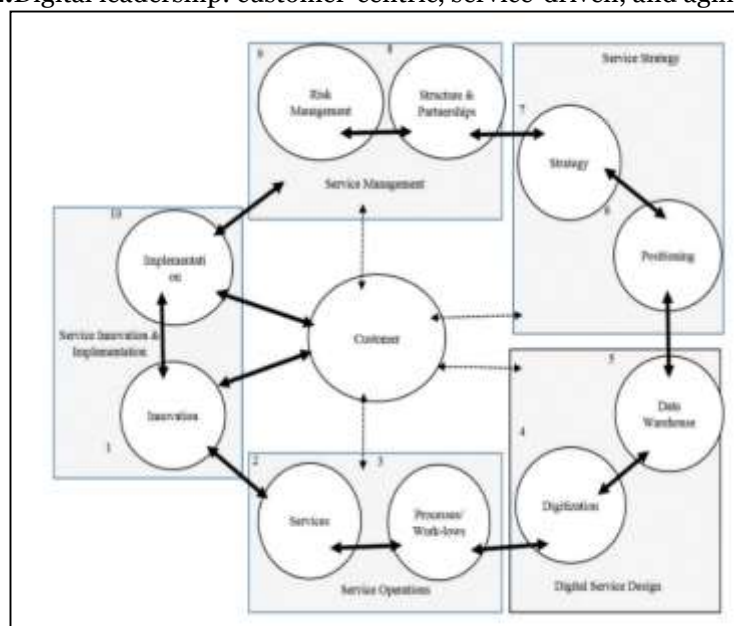
Figure 1. Fostering a Culture of Inns in Digital Leadership. Source: <https://doi.org/10.1177/09722629209859>

Examine the necessity of promoting a culture of innovation within businesses under the guidance of digital leaders. In the era of digitalization, innovation is not only a trendy term but a crucial requirement for organisations to prosper in a constantly evolving environment. Traditionally, innovation was often considered the duty of a specialised research and development team, while leaders largely concentrated on operational efficiency and stability. Nevertheless, the advent of the digital era has challenged this conventional way of thinking by highlighting the importance of integrating innovation into the fundamental nature of any organisation (Sinek, Simon et al., 2014). Effective digital executives understand the importance of cultivating an environment that promotes innovation in order to maintain competitiveness, adapt to changing client demands, and take advantage of emerging prospects. This culture fosters and promotes creativity, experimentation, and risk-taking at every level of the business. An essential element in promoting innovation is establishing a conducive atmosphere wherein individuals are enabled to actively contribute their ideas and thoughts. Forward-thinking executives actively solicit and appreciate employee input, acknowledging that innovation can arise from unforeseen origins. They promote transparent communication and offer avenues for employees to express their ideas through brainstorming sessions, innovation challenges, or digital collaboration tools.

In addition, digital leaders recognise that failure is an intrinsic component of the innovation process. They establish a secure environment for employees to engage in deliberate and measured risks, explore novel methods, and gain insights from their errors. Failure is not seen as a setback, but rather as a precious chance to learn and maybe make significant advancements. Innovation encompasses not only product development, but also processes, business models, and consumer experiences. Digital leaders have the ability to quickly and effectively adjust and change their strategies and approaches in order to respond to shifting market conditions and new prospects. They are receptive to investigating novel business approaches, adopting digital technologies, and maintaining a competitive edge by keeping up with industry changes. (Maxwell, John C. et al., 2019)

The Key Principles of Effective Digital Leadership

Successful digital leadership is not a result of luck; it is guided by fundamental ideas that establish a strong basis for organisations starting their digital transformation. These concepts comprise a range of essential skills and attitudes that are crucial in the digital era.

Figure 2. Digital leadership: customer-centric, service-driven, and agility-focused.

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The Challenges and Opportunities of Digital Leadership

Digital leadership is crucial in the current era of technology, yet it presents distinct difficulties and opportunities. Leaders that can adeptly negotiate these issues frequently position themselves at the forefront of innovation and progress. In this article, we examine many significant problems and the potential opportunities they offer.:

Digital Transformation Complexity

Digital transformation is a complex process that involves multiple areas of a company. The journey involves intrinsic complexity, encompassing tasks such as selecting appropriate technologies, reinventing business processes, and fostering a digital culture. Yet, within this intricacy, there exists the chance to optimise processes, enhance productivity, and establish a more adaptable and customer-focused organisation. Those who are able to simplify intricate processes in the digital realm are in a prime position to bring about substantial and beneficial change. (Brynjolfsson, Erik et al., 2014)

Cybersecurity and Risk Management

In a society that is becoming more and more reliant on digital technology, ensuring the security of computer systems and effectively managing potential risks are of utmost importance. The digital realm presents novel vulnerabilities, ranging from data breaches to assaults. In order to safeguard their organization's sensitive data and uphold the trust of consumers and stakeholders, digital leaders must take proactive measures to tackle these difficulties. However, this challenge also presents a chance for organisations to enhance their resilience, establish trust, and distinguish themselves from competitors by being a reliable guardian of data and information.

Talent Acquisition and Retention

The competition to attract and retain digital talent is fierce. There is typically a shortage of experienced experts in data science, cybersecurity, and software development compared to the need for them. Effective digital leaders must formulate plans to cultivate high-performing digital teams and foster the growth of organisational talent. Nevertheless, by tackling this obstacle, there is a chance to establish a culture of ongoing learning and growth, promoting creativity from within and empowering the business to remain ahead of the current trends.. (Senge, Peter et al., 1990)

Ethical Considerations

The advent of the digital era presents ethical quandaries concerning data privacy, artificial intelligence, and automation. As they drive innovation and uphold customer trust, digital executives must skilfully negotiate these ethical considerations. Tackling these problems involves ensuring compliance and seizing the chance to

showcase ethical leadership, cultivate a favourable brand image, and attract customers that prioritise ethical conduct.

Globalisation and Digital Ecosystems

It is essential for digital leaders to take into account the wider global context and the changing digital environments. The presence of a globally interconnected digital environment brings forth both difficulties and possibilities. Although global markets present opportunities for growth, they also necessitate a comprehensive comprehension of many cultures, rules, and competitive environments. Those that are able to effectively negotiate the complexities of the digital landscape can access untapped markets, establish strategic alliances, and position their companies as global frontrunners. (Maxwell, John C. et al., 2019)

It is clear from this section that each difficulty in the digital leadership landscape presents a chance for growth, innovation, and competitive advantage. Recognising and taking advantage of these opportunities is a crucial skill for digital leaders, since it may lead their businesses to long-term success in the digital era. Through demonstrating resilience and adaptation, digital leaders can effectively navigate their businesses through the process of digital transformation with assurance and foresight (Table-1)

Table 1. Challenges and Opportunities of Digital Leadership

Challenges	Opportunities
Digital Transformation Complexity	<ul style="list-style-type: none"> • Streamline operations and improve efficiency. • Create a more agile and customer-centric organisation. • Drive significant positive change.
Cybersecurity and Risk Management	<ul style="list-style-type: none"> • Protect sensitive information and maintain trust. • Build resilience and differentiation in the market. • Be a trusted custodian of data and information.
Talent Acquisition and Retention	<ul style="list-style-type: none"> • Build high-performing digital teams. • Nurturing talent within the organisation • Create a culture of continuous learning and development. • Foster innovation from within the organisation. • Stay ahead of the curve in the competitive landscape.
Ethical Considerations	<ul style="list-style-type: none"> • Demonstrate ethical leadership. • Build a positive brand reputation. • Engage customers who value ethical practices.
Globalisation and Digital Ecosystems	<ul style="list-style-type: none"> • Tap into new markets. • Forge strategic partnerships. • Position the organisation as a global leader. • Leverage opportunities in a globally connected digital world.

The Digital Age Disrupts Traditional Leadership Hierarchies

In the ever-changing environment of the digital era, the conventional structures of leadership that formerly characterised businesses have experienced a significant upheaval. Traditionally, leadership was defined by a hierarchical structure, in which authority and the ability to make decisions were centralised at the highest levels of enterprises. Leaders were seen as the exclusive creators of organisational strategy, and their instructions were obeyed without hesitation. This hierarchical structure was effective in stable and predictable contexts. Nevertheless, the advent of the digital era ushered in a profound revolution of this traditional leadership paradigm. The widespread adoption of digital technology, easy availability of information, and the increasing prevalence of remote work arrangements have posed a challenge to the traditional concept of leadership based on a command-and-control structure. Leaders in this transformed environment were confronted with a workforce that expressed a strong desire for increased independence, involvement in the decision-making process, and chances to collaborate. (Li, Charlene et al., 2017)

Recognising the need to thrive in a changing environment, digital leaders understood the importance of adapting to a more dispersed and collaborative leadership style. This transition required surrendering certain levels of authority and adopting a more egalitarian organisational framework where the responsibility for decision-making was dispersed among multiple levels. Leaders assumed the role of facilitators, encouraging the development of collective intelligence by promoting a culture of transparent communication and collaborative decision-making. Moreover, the advent of the digital era has fundamentally altered the distribution of power within businesses. Employees acquired access to information and knowledge that was previously restricted to senior leaders. Digital tools and platforms have made information more accessible to everyone, creating a fairer and more equal playing field and lessening the imbalance of information. Consequently, leaders were required to adjust to a novel situation in which power became less concentrated and competence became dispersed throughout the company. (Sinek, Simon et al., 2014).

Collaboration as a Cornerstone of Digital Leadership

In the era of digitalization, leadership is no longer equivalent to making decisions alone and having hierarchical power. Conversely, teamwork has emerged as a distinguishing characteristic of successful leadership. (Li, Charlene et al., 2017). Collaborative leadership acknowledges that both innovation and problem-solving are not limited to the highest levels of an organisation. In the digital age, effective leaders recognise the presence of varied viewpoints and specialised knowledge throughout the business. They understand that harnessing this collective intelligence is crucial for achieving success. As a result, they promote transparent communication, collaborative decision-making, and engaged involvement from employees at all levels.

The utilisation of digital tools and platforms has been crucial in enabling and supporting this collaborative leadership approach. These technologies facilitate instantaneous communication, the exchange of information, and the distribution of decision-making power. Leaders utilise digital platforms to establish virtual environments where teams may communicate regardless of geographical limitations, promoting a culture of cross-functional teamwork and information sharing (Senge, Peter et al., 1990).

Furthermore, collaborative leadership is distinguished by a readiness to attentively listen and adjust to a wide range of opinions. Leaders proactively solicit advice from employees with diverse backgrounds and experiences, acknowledging that this multiplicity of perspectives fosters more innovation in problem-solving. They place importance on and incorporate many perspectives, resulting in more comprehensive decision-making and strategic planning. Collaboration also expands to include external partnerships and alliances, in addition to internal teams. Effective digital leaders recognise the importance of working together with other businesses, startups, and industry players to make use of shared knowledge and resources. Collaborations of this nature have the potential to result in groundbreaking inventions, wider market penetration, and enhanced competitiveness.

. (Sinek, Simon et al., 2014).

The ability of innovation/entrepreneurship

An entrepreneur is not only someone who communicates their ideas and secures resources to bring those ideas to fruition; an entrepreneur is someone who aspires to shape the future. A continuous entrepreneur cultivates a team of individuals who embrace innovation, possess a visionary mindset, and demonstrate business acumen, making entrepreneurship an integral part of their lifestyle.

Digital Skills

Digital skills refer to the abilities required to effectively utilise technology for making informed decisions, gaining a competitive advantage in business, enhancing customer engagement, and facilitating communication with both customers and staff. Proficiency in "digital representation" necessitates adeptness in communicating and sharing within the realm of technology, as well as adopting a more amicable and receptive approach towards fellow members of the digital network. Adopting a "digital stance" enables employees to receive frequent feedback, collaborate on decision-making, and make data-driven judgements.

Strong Networks and Collaboration

It involves including all team members and external stakeholders into the decision-making process, continuously seeking feedback, and promptly adopting the input received. It also entails collaborating with individuals from different industries and adopting a comprehensive strategy that takes into account more than simply one's immediate environment.

Attaining loyal participation via vision

Acquiring committed engagement through vision involves motivating colleagues by showcasing a clear goal, involving them in the decision-making process, and establishing a unique network by promoting active involvement and fostering connections among team members. Additionally, it entails acquiring intimate knowledge about others, demonstrating concern for their desires, and assisting them in uncovering their abilities.

Miller defines digital leadership as the act of enhancing the lives, well-being, and circumstances of people through the use of widespread technological access (Miller, 2018). According to El Sawy et al., digital leadership refers to the act of making decisions that benefit both a company's business ecosystems and the overall success of digitalization. Digital leadership entails a distinct approach to corporate strategy, business models, the role of IT, enterprise platforms, mindsets, skill sets, and workplaces (El Sawy et al., 2016).

Maks Belitski, the instructor of the "Entrepreneurship" course at Henley company School, provides the following definition of digital leadership (Turan, 2018): "...An individual aspiring to be a leader can begin by focusing on one of three concepts, derived from three different beginning points: strategy, company management, or information technologies. Subsequently, he constructs upon it, expands upon it, and nourishes the fields in a diagonal manner. This individual is a leader who possesses expertise in multiple

disciplines, making them a hybrid leader. This leader possesses a comprehensive comprehension of the emerging digital age and also demonstrates a strategic perspective of the market, the product under development, and how technology can be leveraged to gain a competitive edge.

According to Belitski, digital leadership involves combining the skills from several disciplines in the digitalized environment. The fundamental constituents can be elucidated as follows (Turan, 2018):

- **ICT (Information and Communication Technologies) Capability:** Proficiency in using emerging applications and technology, such as cloud computing, big data, and data analytics, in addition to communication technologies. The characteristic that sets digital leadership apart is its distinctiveness.
- **Business Acumen:** The focus lies on possessing a practical and strategic mindset, as well as the capacity to comprehend the workings of the business, rather than having an exhaustive comprehension of the existing business model. This is because the realm of "business" is currently undergoing rapid transformations, necessitating a leader who is adept and extensively trained in various domains, such as sales, marketing, and finance.
- **Strategic Leadership:** Strategic thinking encompasses the capability to anticipate emerging trends, forecast future expectations, determine the optimal course for the company, and effectively manage business operations. It involves the ability to discern both present and future client desires and align them with the organization's objectives..

Sinan Ata, director of Crossover Local Operations, stated at the "Digital Leadership" event held by Crossover that digital leadership is best acquired through practical experience rather than formal education or reading materials. Consequently, firms are required to grant employees, beginning from the most junior administrative roles, the autonomy to engage in experimentation, testing, and error-making. He further stated that Turkish enterprises are establishing a high standard in this field. Nevertheless, there is an immediate need to incorporate technology into human resources operations in order to facilitate the management of human resources regardless of time and location constraints. (Ata, 2018).

Transformation of Leadership

The topic of leadership transformation in the digital era has garnered significant interest from both scholars and practitioners, fundamentally altering our comprehension of leadership in a progressively networked and technology-oriented society. Traditionally, leadership was frequently associated with a hierarchical structure and a top-down methodology, in which leaders possessed the right to make decisions and subordinates adhered to instructions. The traditional leadership model remained prevalent throughout the industrial age, which was marked by stability and predictability (Bass, 1985).

Nevertheless, the emergence of the digital era has questioned the fundamental principles of this hierarchical leadership model. The swift and widespread adoption of digital technology, the widespread access to information through the Internet, and the emergence of collaborative work environments have cumulatively caused significant changes to traditional concepts of leadership (Bennis & Nanus, 1985). In the digital era, leadership is marked by a growing emphasis on cooperation, adaptability, and a significant change in how authority is distributed within organisations. A key characteristic of leadership in the digital era is its emphasis on collaboration. Leadership has evolved from being a single decision-making role in a rigid hierarchy to become facilitators of collaborative intelligence (Yukl, 2010).

Leaders in the business realise that varied viewpoints and experiences can lead to new solutions and problem-solving. Therefore, collaboration is promoted at all levels of the organisation (Bryant, 2003). Digital leaders cultivate an atmosphere that promotes transparent communication, collaborative decision-making, and a receptive attitude towards the ideas and perspectives of their teams (Lipman-Blumen, 1996).

The use of digital tools and platforms is essential in this collaborative leadership approach. These technologies facilitate instantaneous communication, the exchange of knowledge, and the distribution of decision-making power, resulting in a leadership approach that is more democratic and inclusive (Waber et al., 2014). They enable employees throughout the business to actively engage in decision-making processes, surpassing conventional hierarchies. Furthermore, the digital era has increased the significance of digital expertise in leadership. Digital acumen refers to a wide range of skills and knowledge connected to digital technology, data analytics, and new trends (Cascio & Montealegre, 2016).

Leaders are not always required to possess technical expertise, but they are expected to have a strong command of technology terminology and comprehend the ways in which digital technologies may facilitate innovation and optimise workflows (Weill & Woerner, 2015). Having a strong understanding of digital fluency enables executives to make well-informed choices regarding technology investments, assess possible risks, and see opportunities for innovation (Galliers & Leidner, 2014). Aside from technological expertise, digital acumen also includes an understanding of digital vulnerabilities and problems related to cybersecurity. Cyber threats and

data breaches are constant dangers in the digital environment, making cybersecurity a crucial worry for leaders (Buchanan & Brynjolfsson, 2016).

Digital leaders that have a significant impact prioritise cybersecurity in order to safeguard their organization's sensitive data and uphold the trust of consumers and stakeholders (Hempel & Trexler, 2017). Moreover, cultivating a culture of innovation has emerged as a prominent topic in leadership literature in the era of digital technology. In contemporary perspectives, innovation is no longer perceived as a solitary procedure, but rather as a cultural mentality that should infiltrate the entire organisation (Kuratko et al., 2017). Digital leaders comprehend that cultivating a culture of innovation necessitates establishing an atmosphere in which employees are authorised to contribute their ideas, undertake calculated risks, and explore novel approaches (Amabile & Khaire, 2008). This approach signifies a departure from the apprehension of failure that frequently typified conventional organisations, as digital leaders acknowledge that failure can yield valuable insights and revolutionary innovations (O'Reilly & Tushman, 2016).

The Digital Acumen Imperative in Leadership

Leaders in the current age of swift technology progress must possess a profound comprehension of digital technologies, their consequences, and their capacity to revolutionise industries (Cascio & Montealegre, 2016). Historically, leadership may have necessitated a greater degree of technological aptitude. Leaders typically prioritise strategic decision-making, organisational management, and interpersonal skills. Nevertheless, as the digital environment progressed, the demands placed on leaders also advanced.

Digital acumen refers to a wide range of skills and knowledge connected to digital technologies, data analytics, and new trends. Although leaders may not have possess technical expertise, they are required to have a comprehensive understanding of the terminology and concepts related to technology (Weill & Woerner, 2015). Leaders that possess this fluency are able to make well-informed decisions regarding technology investments, assess possible risks and benefits, and see chances for innovation (Galliers & Leidner, 2014). An essential element of digital expertise is utilising technology to get a competitive edge. Digital leaders possess a comprehensive understanding of how digital tools may optimise processes, improve customer experiences, and foster innovation (Westerman et al., 2014).

They proactively pursue chances to incorporate technology into different aspects of their organisations, including marketing, sales, supply chain management, and customer support. In addition, digital leaders place a high importance on cybersecurity and risk management as crucial elements of their digital expertise. The digital environment presents novel vulnerabilities, ranging from data breaches to cyberattacks (Buchanan & Brynjolfsson, 2016). Forward-thinking individuals in positions of digital leadership acknowledge the significance of ensuring the security of confidential information and shielding their organisations from such potential dangers (Hempel & Trexler, 2017).

Moreover, digital acumen encompasses a keen understanding of nascent technology and developing trends. Effective leaders dedicate time to ongoing education, closely observe the digital environment, and recognise emerging possibilities and possible sources of disruption (Galliers & Leidner, 2014). They actively participate in continuous education, participate in industry conferences, and work with specialists to remain well-informed and innovative. In the digital age, possessing digital savvy is essential for effective leadership. Leaders that possess a strong understanding of digital technology are more capable of effectively managing the challenges of the digital world, implementing digital transformation projects, and positioning their organisations for success in a fiercely competitive and fast changing environment (Table-2)

Table 2.Aspects of Digital Acumen

Aspects of Digital Acumen	Description
Technological Proficiency	<ul style="list-style-type: none"> • Leaders are expected to be fluent in the language of technology. • Enables informed decisions about technology investments. • Evaluation of potential risks and rewards. • Identification of opportunities for innovation.
Leveraging Technology for Competitive Advantage	<ul style="list-style-type: none"> • Understanding how digital tools streamline processes. • Enhancing customer experiences. • Driving innovation within the organisation. • Integrating technology across various facets of the organisation.
Cybersecurity and Risk Management	<ul style="list-style-type: none"> • Recognising the importance of safeguarding sensitive data. • Protecting the organisation from vulnerabilities, data breaches, and cyberattacks. • Building a resilient digital infrastructure.
Awareness of Emerging Technologies and Trends	<ul style="list-style-type: none"> • Continuous learning and monitoring of the digital landscape. • Identifying new opportunities for innovation and potential disruptors.

- Engagement in ongoing education, industry conferences, and collaboration with experts.
- Staying informed and innovative in a rapidly evolving digital environment.

Fostering a Culture of Innovation in Digital Leadership

This text explores the important significance of cultivating a culture of innovation within businesses that are headed by digital leaders. In today's digital era, innovation is not just a trendy term, but a crucial requirement for organisations to succeed in a constantly evolving environment (Kuratko et al., 2017).

In the past, innovation may have been perceived as the duty of specialised research and development teams, while executives generally prioritised operational efficiency and stability. Nevertheless, the advent of the digital era has significantly increased the significance of innovation as a cultural mentality that should be ingrained throughout the entire business (Amabile & Khaire, 2008).

Cultivating a culture of innovation entails establishing a conducive atmosphere where people are empowered to actively contribute their ideas and insights (Bass, 1985). Leaders that are knowledgeable in digital technology recognise that novel ideas and significant advancements can arise from unanticipated sources within a company (Yukl, 2010). They promote transparent communication and offer channels for employees to express their ideas, such as brainstorming sessions.

The Digital Leadership Imperative for Innovation

The need of cultivating a culture of innovation within businesses, led by digital leaders, cannot be emphasised enough in the constantly changing digital environment. Innovation has evolved from being a trendy term to becoming an essential strategy for organisations seeking to succeed in a fast-paced and competitive world. This section explores the essential role that digital leaders play in promoting innovation as a central aspect of their leadership style.

Historically, innovation was often limited to dedicated research and development teams, while organisational leaders largely prioritised operational efficiency and stability. Nevertheless, the advent of the digital age has brought about a fundamental change in thinking, emphasising the significance of innovation as a cultural mentality that should be present throughout the entire business. Leaders are now required to actively promote innovation as a crucial priority, acknowledging its central role in staying ahead of the competition and retaining a competitive edge. (Cascio & Montealegre, 2016).

Empowering Employee Creativity and Contribution

The key to cultivating a culture of innovation is to empower people, allowing them to freely express their ideas and actively contribute to the process of innovation. Forward-thinking individuals in positions of digital leadership recognise that unconventional organisational sources have the potential to generate new solutions and significant advancements. This section examines how digital leaders promote transparent communication and establish channels for employees to express their ideas through brainstorming sessions, innovation workshops, or digital collaboration tools. In order to cultivate creativity, leaders must establish a conducive atmosphere where people feel empowered to express their ideas without any apprehension of criticism or retaliation. This entails furnishing the requisite platforms and resources, as well as actively attending to and appreciating the input of each team member. Digital leaders exemplify their openness to novel concepts and their readiness to adopt change, serving as role models (Avolio et al., 2000).

In addition, digital leaders acknowledge that diversity and inclusion are essential elements in promoting innovation. They aggressively solicit input from personnel with varied backgrounds, experiences, and viewpoints, recognising that this diversity of thinking fosters the development of more inventive solutions. By fostering an inclusive culture that values and acknowledges many perspectives, digital leaders are able to harness the complete capabilities of their team, thereby stimulating internal innovation.

Nurturing a Culture of Experimentation and Risk-Taking

Innovation often involves experimentation and an inherent level of risk. Digital leaders understand that fostering a culture of innovation also means creating a safe space for experimentation and risk-taking. This subheading explores how leaders encourage employees to test new ideas, even if they may lead to failures, as they recognise that innovation thrives in an environment where failures are viewed as valuable learning experiences.

Digital leaders set the tone for this experimentation culture by celebrating successes and failures. They understand that only some innovative ideas will yield immediate results, but each attempt contributes to the organisation's learning and growth. By creating a culture where calculated risks are encouraged and learning from failures is embraced, digital leaders pave the way for continuous innovation (Avolio et al., 2000).

Aligning Innovation with Strategic Objectives

To be effective, innovation must be aligned with the organisation's strategic objectives. Digital leaders play a crucial role in ensuring that innovation efforts are purposeful and directed towards achieving long-term goals. This subheading explores how leaders establish a clear innovation strategy aligning with the organisation's vision and mission.

Digital leaders define the strategic areas where innovation is most needed and allocate resources accordingly. They communicate the importance of innovation in achieving the organisation's strategic goals and provide support and guidance to innovation teams. By aligning innovation with strategic objectives, digital leaders ensure that innovation efforts are not just creative experiments but meaningful contributions to the organisation's success in the digital age (Schwarz Müller et al., 2018).

AI and Cloud Computing in Digital Leadership

Digital leadership in today's business landscape often relies heavily on leveraging cutting-edge technologies such as Artificial Intelligence (AI) and Cloud Computing. These technologies have become instrumental in shaping digital strategies for businesses across various industries.

AI in Digital Leadership

AI plays a crucial role in digital leadership by enabling organisations to make data-driven decisions, enhance customer experiences, and streamline operations. Here are some key aspects:

- **Predictive Analytics:** AI algorithms can analyse vast amounts of data to predict future trends, customer behaviour, and market shifts. This helps leaders make informed decisions. (Dennison et al., 2023)
- **Personalisation:** AI-powered personalisation tailors products and services to individual customer preferences, improving customer satisfaction and loyalty.
- **Automation:** AI-driven automation reduces manual tasks, enhances efficiency, and reduces errors, allowing leaders to focus on strategic initiatives. (Fleming et al., 2020)
- **Chatbots and Virtual Assistants:** These AI-driven tools improve customer service by providing instant responses and support.
- **Data Security:** AI can be used for threat detection and cybersecurity, a crucial aspect of digital leadership in an increasingly interconnected world. (TechRadar et al., 2022)

Cloud Computing in Digital Leadership

Cloud computing is the backbone of many digital strategies, providing scalability, flexibility, and cost-efficiency.

- **Strategic Leadership:** The ability to foresee new trends, expectations for the future, the direction the company should take, and how to conduct business—the capacity to read what the client will want in the future and what he wants now—are all examples of strategic thinking.
- **Scalability:** Cloud resources can be easily scaled up or down, allowing businesses to adapt to changing demands swiftly.
- **Cost-Efficiency:** Cloud services often follow a pay-as-you-go model, reducing upfront infrastructure costs and improving financial management. (Mazzei, M., & Noble, D. (2017).
- **Collaboration:** Cloud-based tools and platforms facilitate collaboration among remote teams, which is essential in today's globalised work environment. (Dennison et al., 2023)
- **Data Storage and Accessibility:** Cloud storage solutions provide secure, accessible data storage and retrieval from anywhere.
- **Disaster Recovery:** Cloud-based backup and recovery solutions ensure business continuity in the face of disruptions.

Digital Leadership Strategies

In order to maintain consistency in the digital domain or during the process of digital transformation, digital leaders consistently develop visionary objectives and strategies. The attainment of these objectives and the successful execution of these strategies heavily rely on digital literacy, competence, and experience. Organisations rely on leaders who possess emotional intelligence to recognise when their talents in this domain are restricted and delegate responsibility for these matters to others (Sow, 2018). These leaders must possess a comprehensive understanding of digital transformation initiatives. In the era of digitalization, leaders have the ability to avert employee demoralisation and motivation problems by granting authority to other team members to accomplish the desired transformation objective, and by displaying empathy and compassion when faced with difficulties.

Upcoming digital leaders that possess exceptional coaching abilities will be able to establish vibrant cultures that empower and drive high performance (Brett, 2019). Digital leaders possess traits such as a creative mindset, networking acumen, adaptability, motivational coaching skills, digital literacy, democratic negotiation abilities, and a capacity to learn from errors (Klein, 2020). To effectively lead in the digital era,

individuals must possess a range of qualities including vision, courage, inspiration, intellectual stimulation, passion, strategic thinking and planning, focus, collaboration, innovation, adaptability, communication, emotional intelligence, spiritual intelligence, responsibility, and accountability (Daud, 2021)..

- **Setting Clear Goals:** Define specific objectives for implementing different advanced digital technologies aligned with the organisation's digital strategy.
- **Data Governance:** Establish robust practices to ensure data quality, privacy, and compliance (Bennis, 2013).
- **Investment and Training:** Allocate resources for technology investments and train staff to maximise the benefits of digital solutions.
- **Continuous Innovation:** Encourage a culture of innovation to adapt to evolving technologies and stay competitive in the digital landscape (Gartner (2016).

Surveys conducted on Digital Leadership

Based on interviews conducted by MIT with over 1000 CEOs in 131 countries and 27 sectors across various sizes of organisations, it was found that 90% of managers believe that their business is being disrupted or transformed by digital business models. Additionally, 70% of these managers feel that they lack the necessary skills, leadership, or operational structure to effectively adapt to these changes (Bersin, 2016).

A 2015 poll of 4800 US professional executives affirmed that the primary factors driving digital transformation or digitization are strategy, culture, and talent development, rather than technology. The poll also indicated that participants expressed apprehension regarding their ability to effectively navigate their organisations in a digital setting. The definition of digital leadership, which involves making decisions that benefit businesses, the business ecosystem, and the strategic success of digitalization, highlights the distinction between leadership and management, as emphasised by leadership authority Warren Bennis. Bennis states that leadership focuses on the overall success of the organisation, while management is concerned with executing tasks correctly. The inclusion of the business ecosystem in this definition is necessary due to the interconnectivity of the modern world. Strategic success cannot be achieved without considering the business ecosystem (El Sawy et al., 2016).

According to Fujitsu's market research in Europe, IT executives who took part in the study believe that "digitalization is a crucial investment for the future of corporations" and concur that "companies may encounter difficulties if these processes are not expedited." The featured opinions are as outlined by Fujitsu in 2016:

- 70% think that digital projects are a kind of gamble,
- 65% think that digital projects are not managed properly,
- 40% expressed their concern about the slow and incorrect development of the digitalisation projects' possibility of decreasing corporate productivity,
- 38% stated that flaws in the digitalisation projects can cause loss of endorsement and competent employees,
- 33% stated that digital projects cannot be budgeted correctly and therefore cost highly,
- 31% expressed that not being able to prioritise digital projects and the lack of human resources cause a problem,
- 27% stated that the security concern is the biggest obstacle to digitalisation,
- 25% stated that the lack of time and resources is the biggest obstacle to digitalisation,
- 23% think that IT departments are leading the process,
- 20% stated that fast digitalisation could lead the company to failure,
- Moreover, 20% expressed that the customers' demands are triggering elements. Employees follow the customers by 17.7%, management members by 17.6%, and the CEOs by 16.3%.

Another important source of current situation analysis is the Oxford Economics' "Leaders of the Future" survey conducted in 2016. According to this Research conducted with 4100 people from 21 countries and various sectors, "Millennials", whose birth date is close to the millennium, currently constitute the majority of the working population and 20% of the executive class. This generation's view of digitalisation, their satisfaction with the work and policies followed, and 15 satisfactions with the company's talent management programs are significantly different from the previous generation members (Turan, 2018). In this context, it can be foreseen that future digital leaders will experience intergenerational differences in perception, understanding and application in digital transformation.

Looking at Turkey, Consulting & HGA Group Turkey General Manager Murat Ergene, who spoke at the "Digital Transformation Leaders" meeting held by Microsoft, described the situation in general terms by indicating that digital transformation leaders are primarily from IT backgrounds in Turkey. In contrast, in other countries, they are primarily from a marketing background and stated that "According to TUSIAD's 'Digital Transformation in Turkey' report, digital strategist rate in our country is 66% and the rate of 'C Level' executives responsible from digital strategy is 38%. Looking at digital transformation efforts, 7% of the companies are at the beginning stage and 60% are in the development stage. 80% of the companies are considering assigning a Digital Transformation Director (Chief et al.)" (CyberMag, 2018).

On the other hand, companies that rapidly adapt to digital business models today focus on digital behaviour rather than just digitalising. In other words, they are implementing a completely new management model

under managers' leadership. The new management practices focused on empowerment, experimentation, collaboration, data, and speed can be called the "digital DNA". As a result, it can be said that managers should start thinking of themselves as "digital leaders" in the present-day conditions in which the "boss" understanding is no longer valid. The digital leader's task is to focus the organisation on experimentation, innovation, and scaling on standard platforms. These principles will form the basis of success in the following destructive years (Bersin, 2016).

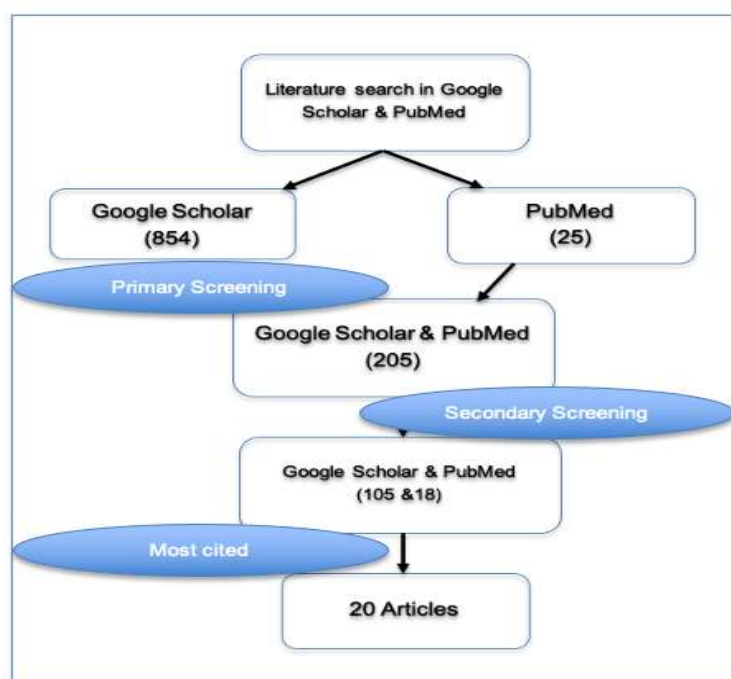


Figure 3. Literary survey flowchart

Table 3. The brief literary survey report

Author Name and Year	Title	Methods Used	Conclusion
Borowska, G. (2019)	Digital Leadership for Digital Transformation	Literature Review	Digital Leadership is essential for digital transformation. Digital leaders must create a vision, develop, and implement strategies, and foster innovation.
Fernanda Bethlem Tigre, Carla Curado, Paulo Lopes Henriques, 2023	Digital Leadership in an Ever-Changing World: A Bibliometric Analysis of Trends and Challenges	Bibliometric Analysis	Digital Leadership is a rapidly evolving field, and future research should focus on theories and effective practices.
Tagscherer, F., & Carbon, C. C. (2023)	Leadership for successful digitalisation: A literature review on companies' internal and external aspects of digitalisation	Literature Review	Successful digitalisation requires change management, complexity handling, innovation, and external partnerships.
Ghamrawi, N., & M. Tamim, R. (2023)	Digital Leadership: A typology for digital Leadership in higher education: the case of a large-scale mobile technology initiative (using tablets)	Case Study	The typology identifies four types of digital leaders: visionaries, implementers, facilitators, and reflectors.
SAGBAŞ, M., & ERDOĞAN, F. A. (2022)	Digital Leadership: A Systematic Literature Review	Systematic Literature Review	Digital Leadership has four key dimensions: digital vision, digital strategy, digital culture, and digital capability.
Khaw, T. Y., Teoh, A. P., Abdul Khalid, S. N., & Letchmunan, S. (2022)	Digital Leadership in the Context of the COVID-19 Pandemic: A Literature Review	Literature Review	Digital Leadership is crucial for organisations during the COVID-19 pandemic, aiding in remote work and digital transformation.
Karakose, T., Polat, H., & Papadakis, S. (2021)	The impact of digital Leadership on sustainable performance: A systematic literature review	Systematic Literature Review	Digital leaders promote innovation, collaboration, and sustainability in organisations.
Khaw, T. Y., Teoh, A. P., Abdul Khalid, S. N., & Letchmunan, S. (2022)	Digital Leadership: A Conceptual Framework	Conceptual Paper	A conceptual framework of digital Leadership with four key dimensions and contextual importance.
Eryeşil, K. (2021).	Digital Leadership: A Review of the Literature and a Research Agenda	Literature Review	The research agenda focuses on defining digital Leadership, antecedents, consequences, and effective practices.
Adie, B. U., Tate, M., Cho, W., & Valentine, E. (2022)	The digital leader: what one needs to master today's organisational challenges	Literature Review	Identifies ten key competencies essential for digital leaders.
Klus, M. F., & Müller, J. (2021)	Digital Leadership: A Literature Review of the Skills and Competencies Required for Digital Leaders	Literature Review	Four key areas of digital leadership skills and competencies were identified.
Klein, M. (2020).	Digital Leadership: A new leadership style for the 21st century	Literature Review	Digital Leadership is a crucial new leadership style for success in the 21st century.
Franco, M. (Ed.). (2020).	Digital Leadership in Higher Education	Literature Review and Case Studies	Digital Leadership is essential in higher education for innovation and student-centered learning.
Ehlers, U. D. (2020)	Digital workplace and organisation performance: Moderating role of digital leadership capability	Quantitative Study	Digital leadership capability moderates the relationship between the digital workplace and organisational performance.

Chatterjee, S., Chaudhuri, R., Vrontis, D., & Giovando, G. (2023)	Digital Leadership: A new leadership style for the 21st century	Literature Review	Digital Leadership is a new style crucial for success in the digital age.
Phakamach, P., Panjarattanakorn, D., & Onsompant, S. (2023).	Conceptualisation and Development of Digital Leadership to Drive Corporate Digital Transformation for Sustainable Success.	Literature Review	Digital Leadership depends on specific factors such as organisational agility, engagement of skilled staff, leadership skill development, support from technology partners, investment, cultural adaptation, and the alignment of new digital technologies with existing ICT Systems.
Zupancic, T., Herneoja, A., Schoonjans, Y., & Achten, H. (2018)	A research framework of digital Leadership.	Literature review	"Digital leadership" is an "integration of distributed knowledge from social sciences/humanities and digital technologies through the integrative artistic power of Architectural Design applied to the built environment as a real-world research and design laboratory."
Chatterjee, S., Chaudhuri, R., Vrontis, D., & Giovando, G. (2023)	Digital workplace and organisation performance: The moderating role of digital leadership capability.	A survey-based analysis	The study also highlights the significant role of digital Leadership in transforming the workplace.
Niță, V., & Guțu, I. (2023).	The Role of Leadership and Digital Transformation in Higher Education Students' Work Engagement	online survey-based analysis	The current study stresses the importance of internal and external peers in higher education performance through high levels of student learning (work) engagement through Leadership and a uniformly developed digitally transformed higher education environment.
Acharya A, Black RC, Smithies A, Darzi A. (2022)	Evaluating the impact of a digital leadership programme on national digital priorities: a mixed methods study.	Mixed methods like online questionnaires, in-depth interviews and focus groups	Developing a network of digital leaders has facilitated communication between organisations and improved the efficiency of the national digital infrastructure.

Conclusion:

Research shows a significant shift in leadership paradigms due to the digital era. Traditional hierarchical structures are being replaced by decentralized and collaborative models, allowing employees to contribute valuable insights and data. Digital leadership is characterized by collaboration, transparency, and shared decision-making, with leaders acting as facilitators of collective intelligence. Digital acumen is essential for leaders, as they must understand digital technologies and their strategic implications. Competence in cybersecurity, risk management, and technological trends is crucial for maintaining a competitive edge. Innovation is a cornerstone of digital leadership, with leaders creating environments that encourage idea-sharing and risk-taking. Leveraging technologies like AI and cloud computing can improve customer experiences and operational excellence.

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