

## DIGITAL LEADERSHIP IN THE POST-COVID NEW KNOWLEDGE MANAGEMENT ENVIRONMENT

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**Abstract.** *This research aims to bring up a systematic literature review, demonstrating the roots of knowledge dynamics and cultural intelligence as the main drivers for digital leadership. While the internet was created in 1983, according to (Minaev, 2021), nowadays, 5.1 billion people use it daily, generating almost 4 trillion dollars of sales of products and services annually. In this context, digital transformation (DG) must be a significant part of any organizational culture. Digital leadership (DL) is the discipline of driving an organization towards DG in order to maintain competitiveness and agility in a rapidly evolving digital and social landscape. Digital leaders understand the importance of inbound data and are willing to explore how information technology can help an organization become more reactive and receptive to customer needs and changing business conditions and requirements. They value their cultural intelligence (CQ), creativity, communication, and inclination to explore how new emerging technology and digital information can be applied to support business development. The research intends to present a systematic literature review and a bibliographic analysis performed with Nvivo and VOSviewer software, focusing on knowledge dynamics (KD) and CQ as main drivers of digital leadership. Ultimately, our research, rooted in the Web of Science Core Collection database, visually presents a direct and explicit link of the fields related to KD and CQ to the ones related to digital leadership. While digital leadership is becoming the norm in multicultural business contexts, this bibliometric analysis can provide global leaders, researchers, and students with appropriate tools to understand and influence its dynamics via knowledge dynamics and cultural intelligence while underlining the impact of agility and ambidexterity.*

**Keywords:** *digital leadership; multicultural leadership; knowledge dynamics; knowledge management; cultural intelligence; agility; ambidexterity; knowmads.*

### 1. Introduction

While the expression of digital leadership started to be popular in 2015, the last two pandemic years: 2019 and 2020, fundamentally changed almost all existing businesses and fueled the digital transformation at an unseen pace. The phenomenon of working from home and everywhere became the norm while job redesigns were booming due to AI-needed enhancements. Education moved to online and hybrid systems, doctors

offered virtual medical consultations, and fashion design houses started to produce medical masks. According to Satya Nadella, Microsoft's CEO, as cited by Lystra (Lystra, 2021), "Fundamentally, we are moving from a mobile and cloud era to an era of ubiquitous computing and ambient intelligence, a new era which will experience more digitization over the next 10 years than the last 40" (p. 1). In this context, the challenge of digital transformation will, obviously, not be the availability of technology but the development of new adapted and agile leadership competencies (Bratianu & Anagnoste, 2011; Szillat & Breuer, 2019), where according to Paiuc, KQ, and CQ play a pivotal role (Paiuc, 2021b).

The COVID-19 pandemic (Bratianu, 2020; Bratianu & Bejinaru, 2021) quickly challenged the company's business and operating frameworks and models. Everything was revisited: from working patterns and locations, customers' engagement channels, to ranges of offered products and services. On a positive note, being under pressure to adapt fast to new requirements, most organizations gave up their traditional processes and bureaucracy (Handscomb et al., 2020) in exchange for agility, creativity, and individual well-being – all under an increased knowledge entropy (Bratianu, 2019) and generic safety approach.

Many steps were taken since the knowledge creation model, based on the iceberg (explicit - rational knowledge and tacit - experiential-learning knowledge) and flow metaphors, and popularized by Ikujiro Nonaka in 1994 (Nonaka, 1994) and the conservative learning metaphor of the mind as a container (Bereiter, 2002). As the fluid flows, metaphors associated with knowledge induce a limitation of tangibility and linearity for knowledge. Bratianu and Bejinaru (2019) explain the new metaphor of knowledge as an energy that overcomes those limitations. Knowledge is conceived and structured as a field that is composed of three main forms: rational knowledge (RK), emotional knowledge (EK), and spiritual knowledge (SK), while each form of knowledge can be transformed into another through specific dynamics. Rational or explicit knowledge is based on reflection and logical thinking and justified by true belief, while emotional knowledge is subjective and controlled by unconscious thinking (Bratianu & Bejinaru, 2019). Spiritual knowledge is grounded on values and beliefs that are the base of cultural intelligence, and further building on these concepts, we will try to demonstrate within further studies that its role in decision-making (DM) within digital leadership is primordial.

Ang Soon introduced and popularized the cultural intelligence concept (Ang Soon & Linn Van Dyne, 2015) and referred to relating and working effectively in culturally diverse contexts and situations. It is the capability to cross boundaries and prosper in multiple and diverse cultures. Being a multi-dimensional concept framed on cognitive, metacognitive, motivational, and behavioral dimensions (Earley & Ang, 2003), cultural intelligence, according to Jyoti (Jyoti et al., 2019), positively affects cross-cultural adjustments that drive the psychological comfort level that a person has in a working host different culture (Black & Stephens, 1989).

While our analysis goal is to perform a systematic literature review and to identify the main drives of digital leadership and how DG expanded in the post-COVID environment, the research questions are:

*RQ 1: Are knowledge dynamics and cultural intelligence the main drivers of digital leadership?*

## *RQ 2: Are agility and ambidexterity representatives for digital leadership in the post-COVID new knowledge management environment?*

After this brief introductory part and explanations regarding the applied methodology, we will perform a systematic and bibliometric literature review using VOSviewer (van Eck & Waltman, 2014), discuss the results, and share the conclusions and limitations of our present research.

### **2. Literature review**

According to Euler (Euler, 2015), there are three dimensions of digital leadership: the digital tools, the digital natives, and the company's digital transformation. Regarding digital tools, we live in unprecedented times where the COVID pandemic forced almost all companies to develop and adopt adequate software to transform a working face two face industry into a work-from-anywhere platform. Digital natives have grown up under the direct influence of the internet and other modern information technologies. They think, acquire knowledge, and understand the world through technology. Accounting for 27 percent of the global population or about 2 billion people, Millennials are the most representative category of digital natives. Digital transformation is mainly the adoption of digital technology by a company, with common goals for its implementation to improve efficiency, value, or innovation. The four principal areas of digital transformation are Process, Business Model, Domain, and Cultural Transformation. While the total enterprise spending on digital transformations in 2019 was \$2 trillion, the estimated value of direct investments in the digital transformation between 2020 and 2023 is \$6.8 trillion (Eira, 2021). So, if in the beginning, the digital leaders are driving the digital transformations, in the next stages, they are leading the organizations in a digital environment (Klein, 2020).

In this digital, media-saturated world, digital leaders are informing, inspiring, and leading digital transformations and taking the consequences, both benefits and limitations. They ensure the company's economic success and analyze the importance of workforce well-being and rebuilding processes from scratch based on an updated company's culture and three critical areas of action: sustainability, digitalization, and reliability (de la Boutetière, 2018). According to Szillat (Szillat & Breuer, 2019), the main characteristics of a successful digital leader should be: digital vision, customer-centricity, agility, high-risk management, and traditional business acumen. Based on Corbin's work (Corbin, 2011), Klein is adding a new characteristic to the digital leadership panel: ambidexterity as the balance between new and old businesses area, between modern paths and traditions, and between innovation and integration (Klein, 2020).

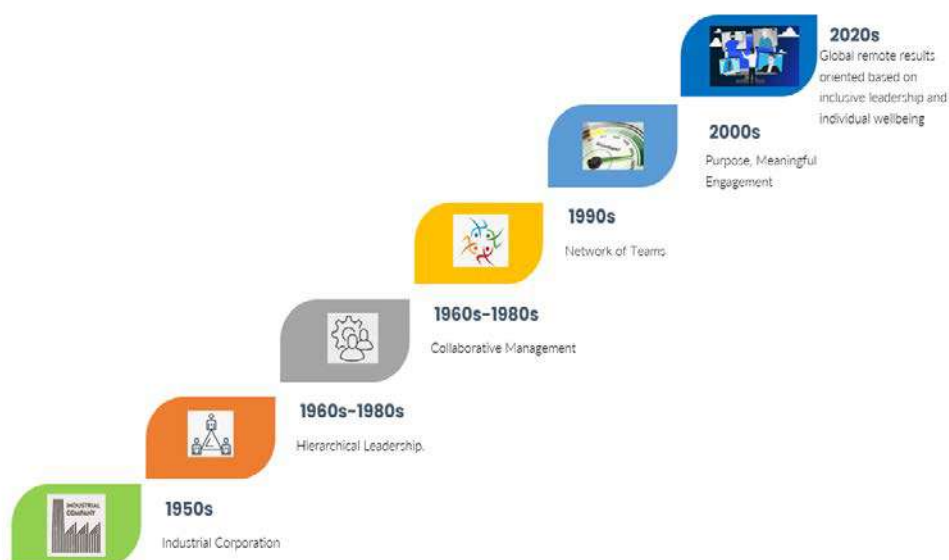
In order to lead the digital transformation, leaders should understand digital technology and, besides cultural intelligence (Bratianu & Paiuc, 2022), a digital leader is also expected to have digital intelligence (Klein, 2020), as the sum of social, cognitive, and emotional abilities that allow individuals to face the challenges and to adapt to the digital world work demands.

DL overlaps with authentic, transactional, and transformational leadership styles. The authentic leadership style of a digital leader drives employees to adopt and develop innovations; the transactional approach reinforces early adoption procedures, while a transformational attitude directly influences digital strategies (Eberl & Drews, 2021).

This is possible only in a context where trust is the main driver and winning formula for new digital leaders (Mugge et al., 2021).

While, according to (KPMG International, 2021), 25%–30% of the workforce will be working from home in 2022, Pieter Levels predicts there will be a billion digital nomads, early adopters of remote work over the past decade, by 2035 and 50% of those will be freelancers (Levels, 2015). This will make up 1 in every 3 employees – from actually already 35 million digital nomads worldwide that continuously combine global travel with online businesses and careers (Malik, 2022). DL should adapt to knowmad's' (Bratianu et al., 2021) new trends: work from anywhere; subscription living and housing-as-a-service; home-schooling and home-education (Razavi, 2020), but also to their most common problems: no “*unplugging after work*”, loneliness, lack of motivation and collaboration, distractions at home (Mukhopadhyay & B.K.Mukhopadhyay, 2021).

The employee experience philosophy concentrates on the workplace as an experience and mixes domains such as public relations and marketing with human resources. Employees' expectations transpose and evolve over time. If work compensations and tangible benefits were the major interest for employees in the past, nowadays, *how it feels to work for the organization* is the motivational trigger to change jobs or to join a new company (KPMG International, 2021).



**Figure 1. The employee experience philosophy – adaptation after (KPMG International, 2021) Global Mobility Forecast: Trends in risk, talent and digital—2021 report, pp 17 and author’s own analysis.**

While 71% of employees are more productive since the 2019 switch to remote work (Wadhvani, 2022), *leader distance theory* indicates that the physical distance and the perceived interaction frequency between managers and their teams could affect the leadership process by reducing the opportunities for support, collaboration, knowledge transfer, and ultimately, influence (Carsten et al., 2021).

Digital leadership, in this post-COVID new knowledge management world, should be an agile and iterative process that addresses a full spectrum of aspects, from employee needs and team and knowledge dynamics to business values.

### 3. Data sources and methodology

The base of this data retrieval is represented by the Web of Science (WoS) core collection, the world's leading analytical information platform, and scientific citation search (Li et al., 2017). The retrieval was done on February 05, 2022, via an advanced search model, while the retrieval time span was the standard one: 1975-2022. We utilized the default values of WoS on all the rest of the retrieval settings, while in terms of the document typology, we have not excluded any.

We have primarily searched our core article expression "digital leadership", followed by a secondary, more extensive search on the broader "multicultural leadership" area. Bellow's results show that the first publications containing "digital leadership", first introduced in 2004, are best represented by 2021 with a 25% share of all-time DL publications. Also, 1996 is the first appearance year for "multicultural leadership" or "multinational leadership", while 15% of publications are concentrated in 2021.

| <b>Researched labels</b>   | <b>The first year of appearance on WoS</b> | <b>Total number of publications to date - on WoS</b> | <b>Weight of 2021 publications with the selected theme within all years - on WoS</b> |
|--|--|--|--|
| "digital leadership"   | 2004                                       | 83   | 25%  |
| "multicultural leadership" or "multi-cultural leadership" or "multinational leadership" or "multi-national leadership" | 1992                                       | 25   | 8%   |

**Table 1. Main concepts frequencies and weight for DL and ML on WoS**  
 [Source: author's own research]

The above analyses show the extreme actuality of our research as DL, which, in 2021, is at its maximum academic shared visibility.

The literature format for all searches was defined as "all types". The most frequent document type for DL is the article: 53 publications (64%). We have the proceeding's paper at the second position: 26 (31%). The table below lists the numbers and proportions of various mentioned document types while all data were downloaded on February 05, 20221, in tab separator format.

**Digital leadership**

| <b>Type of Document</b> | <b>Frequency</b> | <b>Share in total</b> |
|-------------------------|------------------|-----------------------|
| Article                 | 53               | 64%                   |
| Proceeding's paper      | 26               | 31%                   |
| Others                  | 4                | 5%                    |
| <b>Total</b>            | <b>83</b>        | <b>100%</b>           |

**Table 2. Types of retrieved documents for "digital leadership" on WoS**

[Source: authors' own research]

Regarding literature origins, the main analyzed DL's publications came from the United States (14, 17%); however, our study has a global approach relying on the digital leadership published literature from 37 countries.

A summary of the research protocol is presented in table 3:

| <b>Research protocol</b>             | <b>Description</b>   |
|--------------------------------------|--|
| Search expressions                   | "digital leadership"; "multicultural leadership" or "multi-cultural leadership" or "multinational leadership" or "multi-national leadership" |
| Search database                      | Web of Science   |
| Search fields                        | All fields   |
| Type of publications                 | All types of publications indexed in the Web of Science database   |
| Subject Areas                        | All subject areas included in Web of Science, up till mid-February 2022  |
| Timespan                             | 1975-2022  |
| Language                             | All languages  |
| Techniques for bibliometric analysis | Research field mapping (descriptive and performance matrixes via advanced search model) rooted in network analysis.                          |
| Software for bibliometric analysis   | VOSviewer  |

**Table 3. Characteristics and types of the research samples**

[Source: authors' own research]

The WoS exported records contain rich and abundant information (full record and cited references exported to Other Reference Software) such as title, abstract, authors, publication year, subject, source, and references.

The bibliometric software VOSviewer (Visualization of Similarities), conceived by van Eck and Waltman, was used to process the systematic literature review and to analyze and visualize the co-occurrence of keywords by generating a map rooted on the above-mentioned bibliographic data based on a full counting method.

**4. Results and discussions**

As the query DL+CQ+KD is not returning any direct result, we will use in this analysis DL as starting point (processed via VOSviewer) in order to try to answer our two research questions.

The keyword's co-occurrence for digital leadership reflects the research hotspots in the discipline field, while, analyzed via VOSviewer, the 83 DL-related publications provided 423 keywords altogether. Among them, 14 keywords appeared a minimum of 5 times and met the threshold, accounting for 3.30%, but 57 appeared a minimum of two times.

| Search<br>d<br>expressi<br>on | Results<br>[WoS] | Number of<br>keywords<br>[VOSviewer] | Keywords<br>meeting the<br>threshold for a<br>minimum<br>number of<br>occurrences of a<br>keyword of 5 | Keywords meeting<br>the threshold for a<br>minimum number of<br>occurrences of a<br>keyword of 2 |
|-------------------------------|------------------|--------------------------------------|--|--|
| DL                            | 83               | 423                                  | 14   | 57   |

*Table 4. DLs' keywords meeting the threshold  
[Source: authors' own research]*

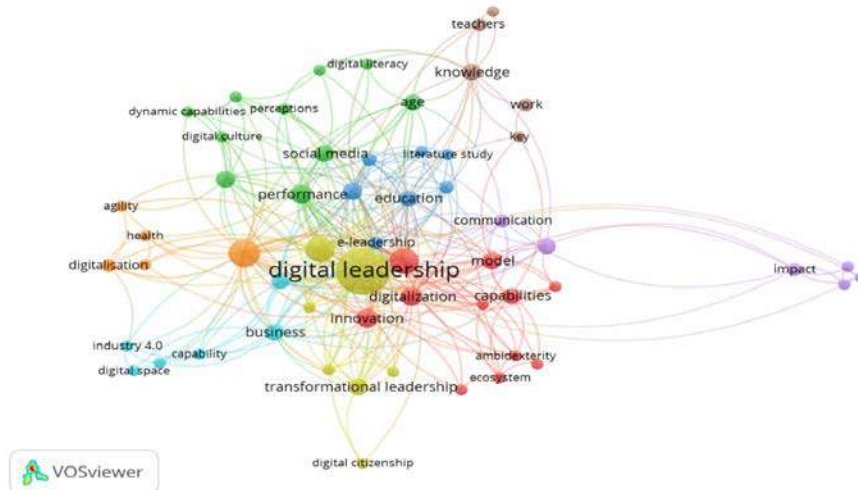
VOSviewer software was used to process and construct the keyword co-occurrence network of each main expression. Regarding all the below figures and tables, the size of the nodes and words represents their weights. The greater the node and word frequency, the larger the weight. The distance between the 2 nodes reflects the strength of their relationship. A shorter distance describes a more substantial relationship. The line between two keywords shows that they have been shown together. The thicker this line is, the more co-occurrence they have. The nodes with the same color are regrouped under a synthetic cluster.

VOSviewer portrays the keywords of DL-related publications into eight clusters – while using the version with 423 keywords, from which 57 meet the threshold of 2. The red cluster (Figure 2, cluster 1, Central-right down, 11 items) focused on the main concepts of “technology”, “digitalization” and “innovation” and enhanced on their “model” and “capabilities”. Bellow table 5 presents this first cluster, colored in red, to acknowledge the structure and relevant information provided by VOSviewer.

| Terms                        | Links | Total link strength | Occurrences |
|------------------------------|-------|---------------------|-------------|
| technology                   | 29    | 44                  | 11          |
| digitalization               | 17    | 21                  | 6           |
| digital strategy; strategies | 7; 12 | 7; 12               | 2; 2        |
| digital age                  | 4     | 4                   | 2           |
| model                        | 17    | 20                  | 5           |
| innovation                   | 13    | 18                  | 6           |
| capabilities                 | 12    | 15                  | 4           |
| ambidexterity                | 8     | 9                   | 2           |
| ecosystem                    | 7     | 7                   | 2           |
| disruption                   | 5     | 5                   | 2           |

**Table 5. DL: Cluster 1: most relevant 11 items (expressions) by VOSviewer**  
 [Source: authors' own research]

The green cluster (Figure 2, cluster 2, up-left positioning, 10 items) is focused on the “performance” of the “digital culture” and “digital literacy”, while the blue cluster (Figure 2, cluster 3, center-up right, 7 items) enhance on “e-leadership matrix as a result of “education”. The yellow cluster (Figure 2, cluster 4, center-down, 7 items) builds on “leadership” with a spotlight on” digital leadership” and “transformational leadership” while the purple cluster (Figure 2, cluster 5, right positioning, 6 items) combined “communication”, and “creatives practice” with “design research” concepts. The sapphire blue or light blue cluster (Figure 2, cluster 6, left-down, 6 items) focuses on “digital space” “business” “capability” while the seventh cluster in orange (Figure 2, cluster 7, left, 5 items) emphasizes on the “digital transformation” and “digitalization” as main sub-drivers of DL. The last cluster in brown (Figure 2, cluster 8, up-right, 5 items) is centered around “knowledge” and knowledge management and dynamics.



**Figure 2. DL: Keyword's co-occurrence network-related publications - by VOSviewer - 57 items meeting the threshold of 2 occurrences of keywords.** [Source: authors' own research]



Bellow the detailed presentations of the clusters as a result of our products query in VOSviewer:

|                   |  |   |   |   |
|-------------------|--|---|---|---|
| Cluster number:   | 1  | 2   | 3   | 4   |
| Cluster colour:   | RED  | GREEN   | BLUE  | YELLOW  |
| Cluster position: | Central-right down   | Up-left   | Center-up right   | Center - down   |
| Cluster content:  | <p>Cluster 1 (11 items)</p> <ul style="list-style-type: none"> <li>ambidexterity</li> <li>capabilities</li> <li>digital age</li> <li>digital strategy</li> <li>digitalization</li> <li>disruption</li> <li>ecosystem *</li> <li>innovation</li> <li>model</li> <li>strategies</li> <li>technology</li> </ul> | <p>Cluster 2 (10 items)</p> <ul style="list-style-type: none"> <li>age</li> <li>digital culture</li> <li>digital literacy</li> <li>dynamic capabilities</li> <li>environments</li> <li>information-technology</li> <li>perceptions</li> <li>performance</li> <li>self-efficacy</li> <li>social media</li> </ul> | <p>Cluster 3 (7 items)</p> <ul style="list-style-type: none"> <li>e-leadership</li> <li>education</li> <li>information-systems</li> <li>literature study</li> <li>organizations</li> <li>strategy</li> <li>structural model of</li> </ul> | <p>Cluster 4 (7 items)</p> <ul style="list-style-type: none"> <li>digital citizenship</li> <li>digital leadership</li> <li>implementation</li> <li>leadership</li> <li>skills</li> <li>styles</li> <li>transformational leader</li> </ul> |
| Cluster number:   | 5  | 6   | 7   | 8   |
| Cluster colour:   | VIOLET   | LIGHT BLUE  | ORANGE  | BROWN   |
| Cluster position: | Right  | Left-down   | Left  | Up- right   |
| Cluster content:  | <p>Cluster 5 (6 items)</p> <ul style="list-style-type: none"> <li>antecedents</li> <li>communication</li> <li>creative practice</li> <li>design research</li> <li>impact</li> <li>research by design</li> </ul>  | <p>Cluster 6 (6 items)</p> <ul style="list-style-type: none"> <li>business</li> <li>capability</li> <li>digital space</li> <li>industry 4.0</li> <li>management</li> <li>trends</li> </ul>  | <p>Cluster 7 (5 items)</p> <ul style="list-style-type: none"> <li>agility</li> <li>digital transformation</li> <li>digitalisation</li> <li>health</li> <li>index</li> </ul>   | <p>Cluster 8 (5 items)</p> <ul style="list-style-type: none"> <li>key</li> <li>knowledge</li> <li>students</li> <li>teachers</li> <li>work</li> </ul>   |

**Figure 3. DL: presentation of the 8 clusters**  
 [Source: authors' own research]

At first analyses, we can see that, as expected, DL has main direct connections with auto-related concepts such as “digital transformation” (Links 32; total link strength 54; occurrences 13); “leadership” (Links 24; total link strength 40; occurrences 11); “technology” (Links 29; total link strength 44; occurrences 11) and “digitalization” (Links 17; total link strength 21; occurrences 6).

The word “performance” has the highest individual non-auto-related link strength to DL (Links 19; total link strength 26; occurrences 6). Alternatively, as demonstrated by (Paiuc, 2021a), “performance” is the most representative predictor and outcome of cultural intelligence as presented in bellow table 6, developed by (Paiuc, 2021a). Backed by “digital culture” (Links 8; total link strength 9; occurrences 2), we have demonstrated that CQ is a main driver for digital leadership.

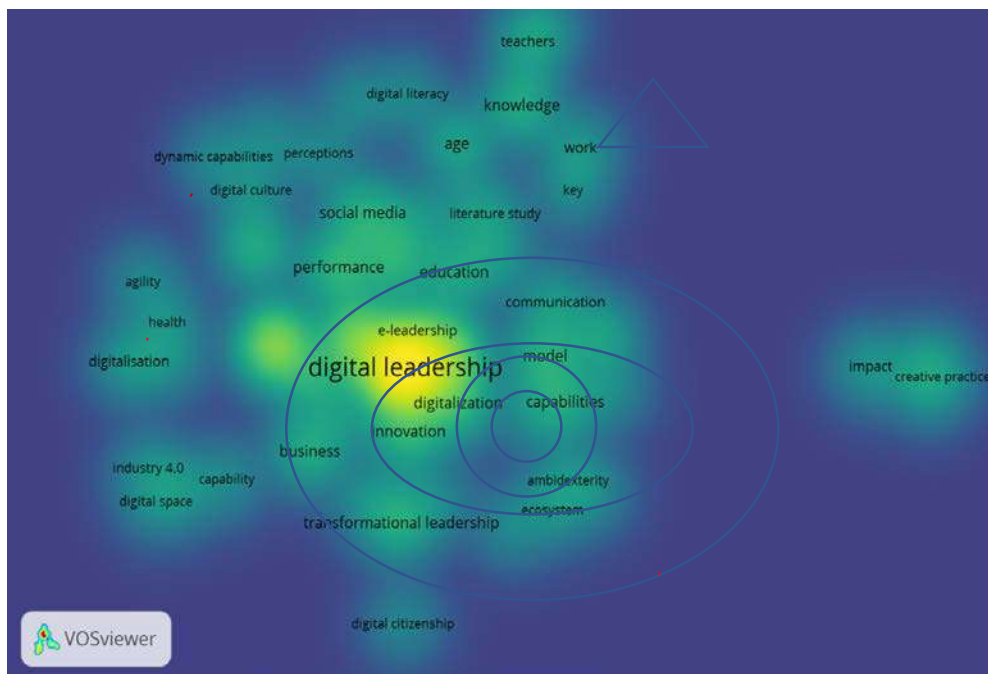
The "knowledge" expression (Links 13; total link strength 14; occurrences 5), backed by "information-technology" (Links 12; total link strength 14; occurrences 5) and "information systems" (Links 11; total link strength 15; occurrences 3) are the basis of the "digital transformation" (Links 32; total link strength 54; occurrences 13). As below table 6, presented by (Paiuc, 2021a), this also underlines KD as an important is and leading facilitator of DL. Digital Leadership is directly connected with "knowledge" but also with capabilities ("capability", "capabilities", "dynamic capabilities") and "education" – which are KD's attributes (Pavlidou et al., 2021).

| First item:           | Second items:  | Link strength: | Cumulated links strength: |
|-----------------------|--|----------------|---------------------------|
| Cultural intelligence | ▪ performance  | 128            | 184                       |
|                       | ▪ job performance; job-performance; firm performance; team performance; task performance; expatriate performance; creative performance | 56             |                           |
|                       | ▪ knowledge; information   | 26             | 54                        |
|                       | ▪ knowledge sharing; knowledge transfer  | 28             |                           |

**Table 6. Keyword's co-occurrence network of CQ-related publications / Direct links to CQ - by VOSviewer**

*[Source: authors' own research "Cultural intelligence as a main competency for multinational leadership and global management" published in STRATEGICA – International Academic Conference/ Knowledge Economy Section / Bucharest -2021]*

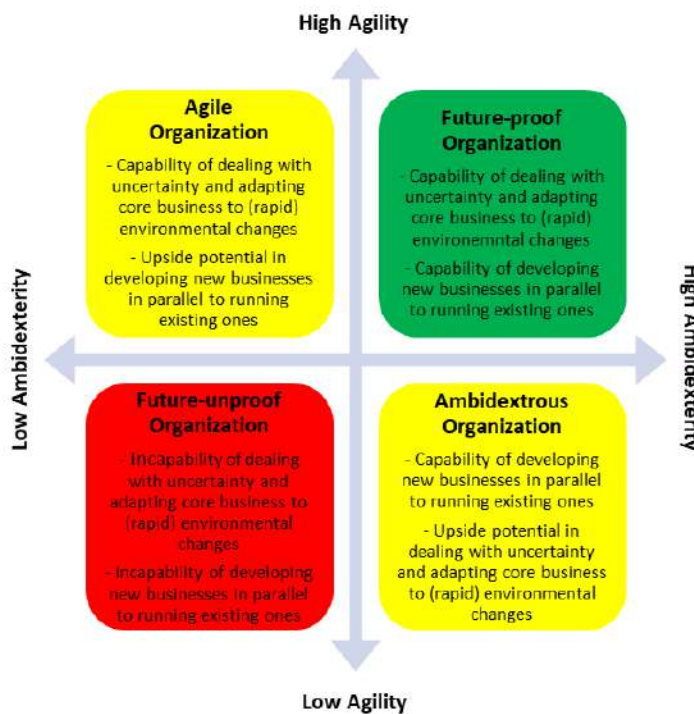
The Density visualization map portrays in a more visual mode the importance of KD and its predictors in the DL by putting it in the focal area of representativity:



**Figure 4. DL- Density Visualization Map – by VOSviewer**  
*[Source: authors' own research]*

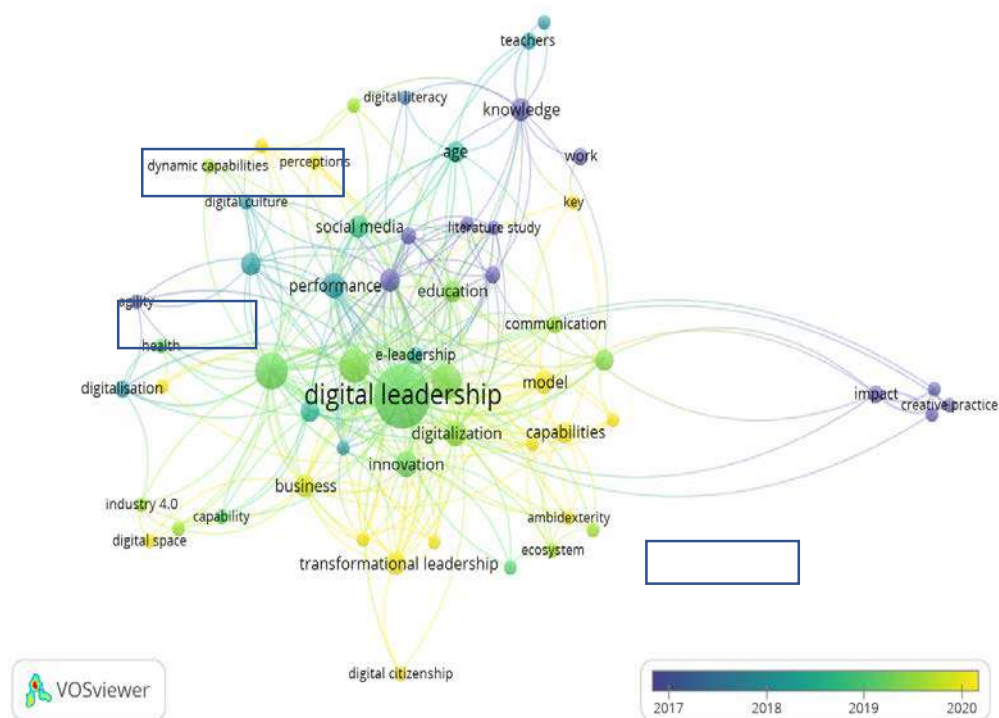
This confirms our first research question that knowledge dynamics and cultural intelligence are the main drivers of digital leadership.

The below overlay visualization enhances the more actual researched themes from 2020 linked to the knowmads phenomenon (Bratianu et al., 2021) that was reinforced by the pandemic years 2019-2020 with a major focus on: "digital citizenship" and "digital space". Also, the 2020s brought "ambidexterity" or "dynamic capabilities" that enhanced the development of new businesses while running existing ones in parallel. The expression prevailed in the 2018th popular "agility" (Kumkale, 2022) as the capacity to deal with uncertainty while rapidly adapting and pivoting the company's core business to a changing conditions market. The below graphical presentation worked by (Ohr, 2020) is mapping the co-existence and the intersection of the two concepts that, in principle, can co-exist, overlap, or be independent:



**Figure 5. DL: Agility- Ambidexterity mapping**  
 [Source: Ralph-Christian Ohr; Future-proof Companies: Combining Agility with Ambidexterity; 2020]

However, the COVID period (2019-2020) reinforced the "ambidexterity" skills, in addition to the "agility" ones from 2017-2018 – as presented in the – timed-framed overlay visualization map of DL:



**Figure 6. DL - Overlay Visualization Map by VOSviewer**  
 [Source: authors' own research]

Our second research question was also answered: agility and ambidexterity are both representatives of digital leadership in the post-COVID new knowledge management environment, and work flexibility must be “business as usual” and not just a commodity to use in times of crisis (Zhan et al., 2020).

## 5. Conclusions and limitations

After these descriptive and performance studies and network analyses, the two research questions were answered, and cultural intelligence and knowledge dynamics were identified as the main drivers of multicultural digital leadership; while both agility and ambidexterity were demonstrated to be representatives of digital leadership in the post-COVID new knowledge management environment.

These research clusters help us visualize the connection between the keywords and central notions' attributes used in the mentioned sources and visually demonstrate a comprehensive overview of CQ and KD's fields as DL's main drivers. However, despite the keen interest in digital leadership among researchers, the concept is still evolving at the same pace as technology, and "work from home/ anywhere", "augmented reality," and "AI" (Smith & Green, 2018) are shaping every day the new shape of DL (Harari, 2019).

*Agility* and *ambidexterity* in conjunction and combination, as reflected by VOSviewer's analysis and backed by (Ohr, 2020), permit organizations and companies to

successfully protect core businesses (*Defensive approach*) while reaching and engaging with future businesses meant to extend or replace existing ones (*Offense approach*).

Despite the efforts to perform this research most accurately, it still has some limitations. The analysis relies on the WoS database and does not consider other data sources like Scopus or Google Scholar. Also, besides the number of publications, future studies should focus more on the quality and impact of the sources. The number of digital leadership-related publications is also expected to increase exponentially in the following years, so the presented results might soon become relatively obsolete.

However, this bibliometric analysis provides a valuable reference for researchers and practitioners in digital leadership, cultural intelligence, and knowledge dynamics, and by linking the three notions within a clear relational concept, and could also be presented to students as part of their multicultural leadership program.

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