Pakistan Journal of Life and Social Sciences
www.pjlss.edu.pk

https://doi.org/10.57239/PJLSS-2024-22.1.00293

RESEARCH ARTICLE

Virtual Leadership Model and Competitive Organizational Culture in The Vuca Era: A Bibliometric Analysis

Septi Wulandari[1*], Esa Septian[2], Didik Gunawan Suharto[3], Musta'ana[4], Manuel Ximenes[5]

[1,2,4]Department of Public Administration, Faculty of Social Science and Political Science, Universitas Bojonegoro, Indonesia
[3]Department of Public Administration, Faculty of Social and Political Sciences, Universitas Sebelas Maret, Indonesia
[5]Department of Socio Economic, Faculty of Agriculture, Universidade Nacional Timor Lorosa'e, Timor Leste

ARTICLE INFO

Received: Apr 24, 2024

Accepted: Jul 8, 2024

Keywords

Competitive organizational culture
Virtual leadership
VUCA

***Corresponding Author:**

septiwuland09@gmail.com

ABSTRACT

The VUCA era describes a situation characterized by uncertainty and rapid change. At the same time, sophisticated information technology has entered the organizational system in all sectors. Virtual leadership and a competitive organizational culture help all sectors to stay competent through this uncertain era. This research aims to formulate a virtual leadership model and competitive organizational culture in the VUCA era. Researchers use Vos Viewer to conduct bibliometric analysis on previous research findings obtained through the PRISMA Systematic literature review model method. The results show that virtual leadership that is agile and creative and applies trust will help organizations succeed in the VUCA era. Intense communication, technology adjustments, and virtual teams will help facilitate the implementation of virtual leadership. In addition, a competitive organizational culture with an agile organization will allow for a proper work culture response. Some of the schemes that can be implemented are sustainable talent management, innovation, and CSR. These findings formulate a suitable model of virtual leadership and competitive organizational culture to get through the VUCA era. The limitations of research only focused globally do not lead to one sector, so the researchers recommend that future researchers highlight specific sectors in depth.

INTRODUCTION

In recent decades, advances in technology and science have driven globalization and global economic growth, making discoveries and transforming all aspects of human life (Bennett & Lemoine, 2014). This transformation process is proceeding at a speed never seen before. As a result, keeping pace with rapid advances in technology, economy, and society driven by the frenzy of the digital revolution and the expansion of global markets is increasingly difficult. The speed of this change makes the organizational context unpredictable or unusable a concept developed by the United States Army after the end of the Cold War, called VUCA (Bennett & Lemoine, 2014; Machado & Brandao, 2019).

VUCA stands for Volatility, Uncertainty, Complexity, and Ambiguity. It is a term used to describe situations characterized by uncertainty and rapid change (Codreanu, 2016; Kennedy, 2020). VUCA is

referred to as a crisis because it can give rise to complex and unpredictable situations that require a quick response (Coronado-Maldonado & Benítez-Márquez, 2023). The presence of VUCA can disrupt the flow of world change both in the business sector and the public sector (Khananda et al., 2024). VUCA can have a significant impact because technology in some regions tends not to keep up with the flow of globalization due to limited resources.

Globalization has accelerated and expanded the flow of goods, services, and people across national borders and increased the demand for a more flexible workforce (Machado & Brandao, 2019; Subrahmanyam, 2023; Kanval et al., 2024). At the same time, advanced information technology has entered organizational systems. In other words, the tools, knowledge, and techniques that support the digitization, planning, decision-making, dissemination, and control of information. Therefore, the phenomena of globalization, technological change, and rapid transformation present new challenges for workers, especially for those who hold leadership positions, regardless of industry and function (Codreanu, 2016; Hamid, 2019). These employees must be trained and prepared to manage and respond to situations in the VUCA world, where communication through technological media is essential.

One form of the VUCA era that occurred some time ago was the COVID-19 pandemic, which impacted all sectors, including the public sector. However, it does not prevent it from continuing to function with online communication media. One way that can be faced with the current post-COVID-19 pandemic conditions is to continue to try to utilize information technology. With developments and innovations in information and communication technology (ICT), such as *e-commerce* and the internet, a new leadership style has emerged called *e-leadership* (Viveiros & Bonomi, 2020).

Leadership has been a central element throughout History (Ashiq et al., 2023; Rashid et al., 2023). Leaders strive to guide and help them evolve to stay relevant and in tune with changing user needs since ancient times (Susilawati, et al., 2021; Suaedi, et al., 2023; Roshida, et al., 2023). Various challenges they have faced, such as the evolution of writing materials from parchment to paper, the printing revolution, the digital revolution, and now the technological revolution (Ashiq et al., 2023). The leadership transition to sustainable, sustainable digital leadership has transformed traditional library leadership practices to effectively manage and utilize digital technologies. This requires adapting digital leadership strategies, capabilities, and mindsets to address the challenges and opportunities presented by the digital age, particularly related to the bibliometric study of library leadership.

Virtual leadership arises from using technology to communicate internally and externally with collaborators from different organizations during the workday and in real-time. Previous research conducted by Septian & Wulandari (2024), virtual leadership is applied with several conditions, including leaders understanding the perceptions of members and organizations, leaders acting as the key to success, leaders obliged to work remotely, leaders following the flow of globalization, and mastering ICT. Virtual leadership is widely applied, especially when the COVID-19 pandemic hit. Most workers are required to work from *home (WFH).* People who work together without meeting physically by utilizing information technology are called virtual teams (Margaret, 2010). In this study, virtual teams are employees who work together without meeting physically by utilizing information technology. In the case of employees working in a hybrid manner between work-from-office (WFO) and WFH, it is called a virtual team only when they work in WFH or WFO but do not meet physically with other employees when working together.

The end of the COVID-19 pandemic as a manifestation of the VUCA era is still ongoing to this day where adaptation continues, and some activities also still utilize information technology and are even forced to use virtual media as sustainability in the future (Pramukti, et al., 2020; Prakoeswa, et al., 2021). Facing a new way of working, it is interesting to establish and analyze organizational problems that arise with social interaction. For example, while most of the workforce worked remotely during

the pandemic, many collaborators relied on interactions with other team members to create innovation or assess risk (Stratone et al., 2022; Willermark & Islind, 2022).

In addition to focusing on *virtual leadership* in the public sector, organizational culture also has a major influence on its success. Organizational culture refers to shared assumptions, values, and norms (Muafi & Roostika, 2022). Culture involves beliefs, values, and behaviors, exists at different levels, and is reflected in various characteristics of organizational life (Econ, 2022; Muafi & Roostika, 2022). Organizational culture is an important factor in the success of any organization. Organizational culture has also been considered a form of organizational capital and a source of competitive advantage (Drljevic et al., 2022; Muafi & Roostika, 2022).

The role of organizations has changed over the years. Organizations are now emphasizing the need for leaders to take on new roles, including coordinating and facilitating the behaviour of others in the workplace. Therefore, organizations need to achieve and maintain a sustainable competitive advantage to continue to grow, paying particular attention to humanitarian issues (Davidaviciene & Al Majzoub, 2022; X. Wang & Zeng, 2017). In addition, many employees must work in teams to achieve complex organizational goals, and work groups are becoming more common in organizations.

In an organization, an individual's abilities are determined by the individual's knowledge, skills, and influences that reflect the ability to deal with the work assigned to him. Correspondingly, organizational capability can be defined as the ability demonstrated by an organization to achieve its objectives through the identification and completion of appropriate work (X. Wang & Zeng, 2017). Competitive organizational cultures tend to have a perspective to see how employees or members compete fairly in creating innovation and excellence in themselves that have an impact on both the company and the organization (Econ, 2022).

This article is updated based on a review of publications in the Scopus database using the keywords "virtual AND leadership AND vuca", "virtual leadership", "competitive AND organizational AND culture, AND vuca", virtual AND leadership, AND competitive AND organizational AND culture. The search was conducted on February 29, 2023, based on publications from 2019 to 2024 found a total of 5 publications with the keywords "virtual AND leadership AND vuca", 1,605 publications with the keywords "virtual AND leadership", one publication with the keywords "competitive AND organizational AND culture, AND vuca", two publications with the keywords "virtual AND leadership, AND competitive AND organizational AND culture", 868 publications "competitive AND organizational AND culture" and no publications with the keywords "virtual AND leadership, AND competitive AND organizational AND culture, AND vuca".

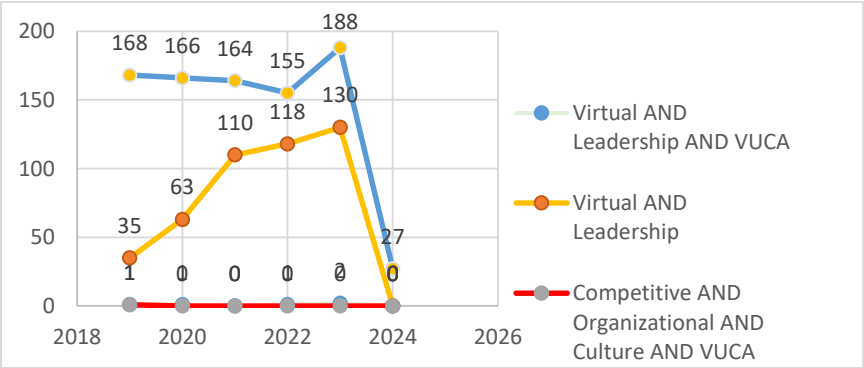

Figure 1. Research Novelty. Source: Data processed by researchers, 2024

So far, research related to virtual leadership and organizational culture has only focused on how technology is utilized and how they adapt (Alon et al., 2023; Khananda et al., 2024; Kheng & Mei,

2023; Kim, 2022; Shal et al., 2024; Subrahmanyam, 2023; X. Wang & Zeng, 2017). In previous research, this is the first time anyone has discussed how virtual leadership models and organizational cultures are competitive in the public sector in the VUCA era. Based on this evidence, this research has empirical novelty. In contrast, there has never been research on virtual leadership models and competitive organizational culture in the public sector, especially in the VUCA era. Theoretical novelty: This research will produce a model to discover the concept of virtual leadership and organizational culture in the public sector. Methodological novelty can be seen in the lack of topics on virtual leadership and competitive organizational culture using bibliometric analysis.

Based on the exposure of the phenomena that occur and evidence of the novelty of researchers, this study aims to (1) formulate a virtual leadership model in the public sector in the VUCA era, (2) formulate a model of competitive organizational culture in the public sector in the VUCA era.

RESEARCH METHOD

Based on the research objectives that want to formulate a virtual leadership model and competitive organizational culture, this study will use a systematic literature review (SLR) to find relevant articles. SLR flows are based on the PRISMA 2020 model (Alfiani et al., 2024; Page et al., 2021; Septianingrum, et al., 2023; Rohmi, et al., 2023; Purwanti, et al., 2024). First, researchers found relevant research using the Scopus database. Scopus has many peer-reviewed journals and a large database and allows researchers access to a wider range of publications to conduct more systematic literature reviews (Carrera-Rivera et al., 2022).

Bibliometric analysis performed with VOS Viewer relies on the identification of Scopus articles. The process of finding and assessing different types of research outputs is known as bibliometric analysis (Zhao et al., 2023). The purpose of a bibliometric review is to identify publications or researchers who have produced widely referenced works in various scientific domains, journals, and topics of study during a certain period (Aria & Cuccurullo, 2017). Visualization of relationships between selected articles is made possible by bibliometric analysis to help find articles. To find research trends on bureaucratic reform in Indonesia, bibliometric analysis uses keyword repetition (Donthu et al., 2021). Therefore, the study relied on Vosviewer bibliometric software to analyze trends in information obtained from the Scopus database (van Eck & Waltman, 2010).

Keywords are based on research topics of virtual leadership and competitive organizational culture in the public sector in the VUCA era. Hence, the keywords used include "virtual leadership", "organizational competitive culture", and "VUCA". Researchers develop essential keywords with synonyms that can expand search results based on recommendations from Scopus searches. More details can be seen in Table 1. The results of the identification of article findings showed as many as 7,579 articles in the Scopus database.

Table 1. Research development with keyword identification

The topic of the article searched	Keyword search	Enrich keyword
Virtual leadership and competitive organizational culture in the public sector in the VUCA era	Virtual leadership	leadership
	Organizational competitive culture	organization
		Organizational culture
	VUCA	-

Source: Data processed by researchers, 2024

Researchers then conduct a screening process against the results of previous identification by conducting inclusion and exclusion criteria (Tricco et al., 2018). The screening of articles that fall into the inclusion category is carried out based on publication year restrictions, which have been limited for the last five years, especially from 2019 to 2024. Then, the type of document is in the form of articles, the language used is English, and articles can be accessed freely. Articles that do not include inclusion criteria will be included in the exclusion criteria. Filtering is also done by looking at the title and abstract of the research to eliminate articles that are not on this topic (Snyder, 2019). A total of 23 articles were obtained from the screening process. The next step is to check the article's content thoroughly to find relevant articles that can answer research questions. From the entire process, a total of 14 articles will be analyzed. The article review process is shown in the flow chart in Figure 2.

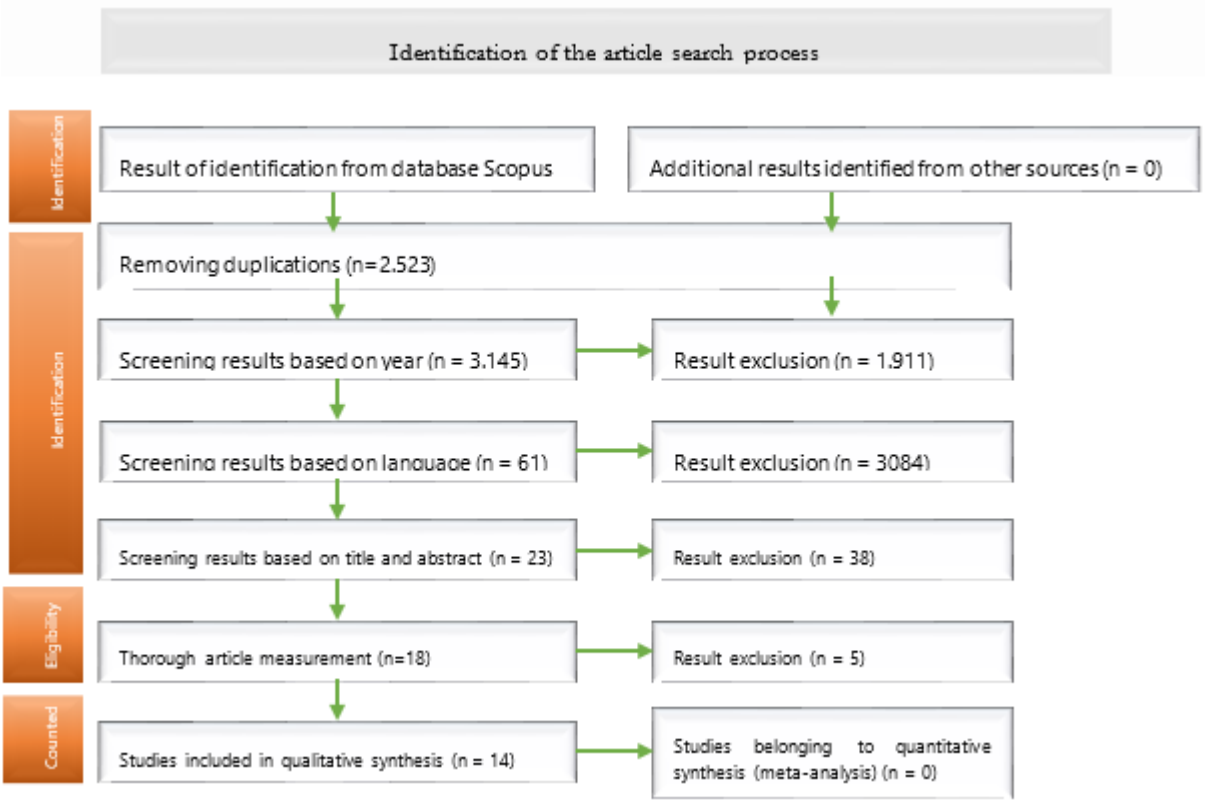

Figure 2. PRISMA search flow chart: Source: Data processed by researcher, 2024.

RESULT AND DISCUSSION

Bibliographic Coupling

Bibliometric analysis (bibliographic coupling) uses the same references to find relationships between scientific documents. In this case, those documents with the same reference and comparable topic or subject are considered the same. The process begins by selecting a reference document and then analyzing the references used by that document on other documents in the database. The document will have a bibliographic coupling if the references used are the same (Guleria & Kaur, 2021; Ma et al., 2022). This method helps in finding groups of documents that have the same topic or subject.

Bibliographic by Virtual Leadership

In this mapping, researchers will map in advance to sub-categories of articles related to virtual leadership in the VUCA era. As shown in Figure 3, the bibliographic coupling results show that seven cluster groups were identified.

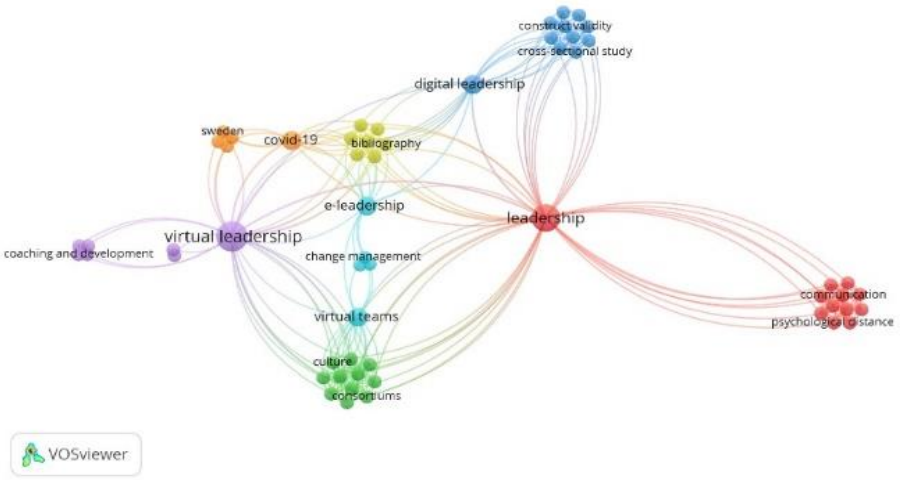

Figure 3. Network Visualization by Vos Viewer, 2024: Source: Data processed by researcher, 2024

Cluster 1 is designated with a network and red nodes consisting of 12 items. Keywords consist of communication, construal level theory, creative leadership, digital communication (Y. Wang & Wang, 2022), leadership, media use (Y. Wang & Wang, 2022), methodology, perception, psychology distance, psychology, social media, and social theory.

Cluster 2 is intended, and nodes are green and consist of 11 keywords including consortiums, culture, disintermediation, distance learning, organizations, partnership, technology mediation, virtual culture, and virtual organization.

Cluster 3 is aimed at dark blue nodes and consists of 11 keywords including construct validity, cross-sectional study, digital leadership (Claassen et al., 2021; Karakose et al., 2022), digitalization, employee, human, major clinical study, municipal administration (Claassen et al., 2021), principle component analysis, score (Claassen et al., 2021), skill.

Cluster 4 is intended with yellow nodes with several 7 keywords that appear including bibliography, bibliometric analysis (Karakose et al., 2022), business development, leadership 4.0 (Karakose et al., 2022), mapping method, technological development, and technology leadership.

Cluster 5 appears with purple variant nodes with several 7 keywords including affordances (Willermark & Islind, 2022), coaching and development, conflict management (Turesky et al., 2020), digitalization of work practice (Willermark & Islind, 2022), trust (Turesky et al., 2020), virtual leadership (Appelgren, 2022; Turesky et al., 2020; Willermark & Islind, 2022), virtual team performance (Subrahmanyam, 2023).

Cluster 6 nodes show a light blue color with 5 keyword categories including change management, cultural constraints, e-leadership, transformative leadership, and virtual teams (Subrahmanyam, 2023; Turesky et al., 2020).

Cluster 7 is shown by orange networks and nodes with 5 keywords that appear among them COVID-19, Crisis Management, Leadership, Media Management, Sweden (Appelgren, 2022).

The keywords in each cluster show words often used in research and to find answers to what you want to research. Furthermore, to find out how virtual leadership in this VUCA era happened, the author also conducted an analysis based on Figure 4 and Figure 5.

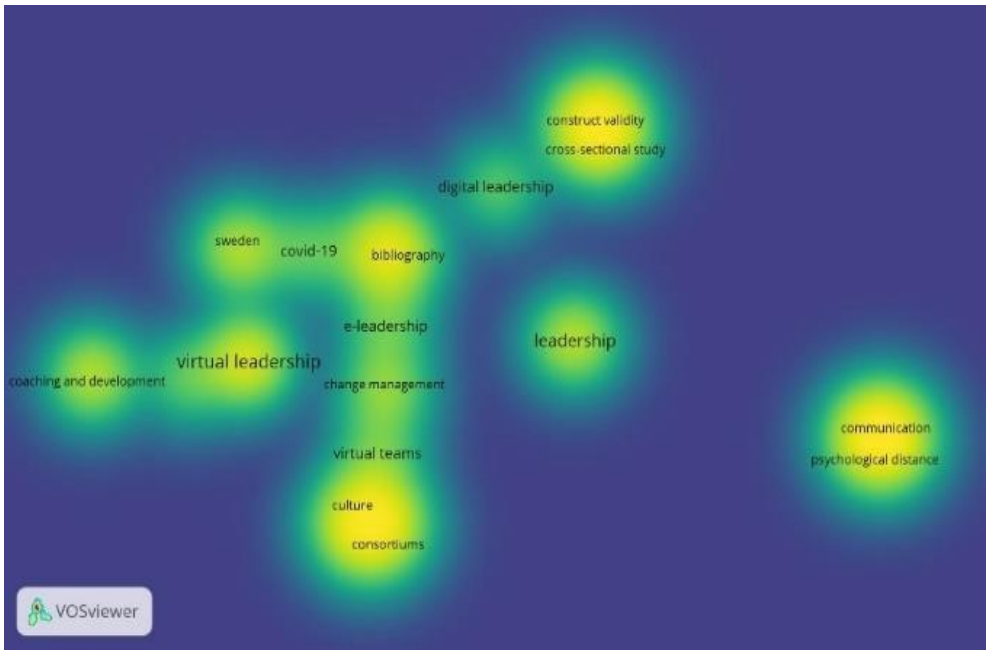

Figure 4. Density Visualization Network by Vos Viewer 2024: Source: Data processed by researcher, 2024

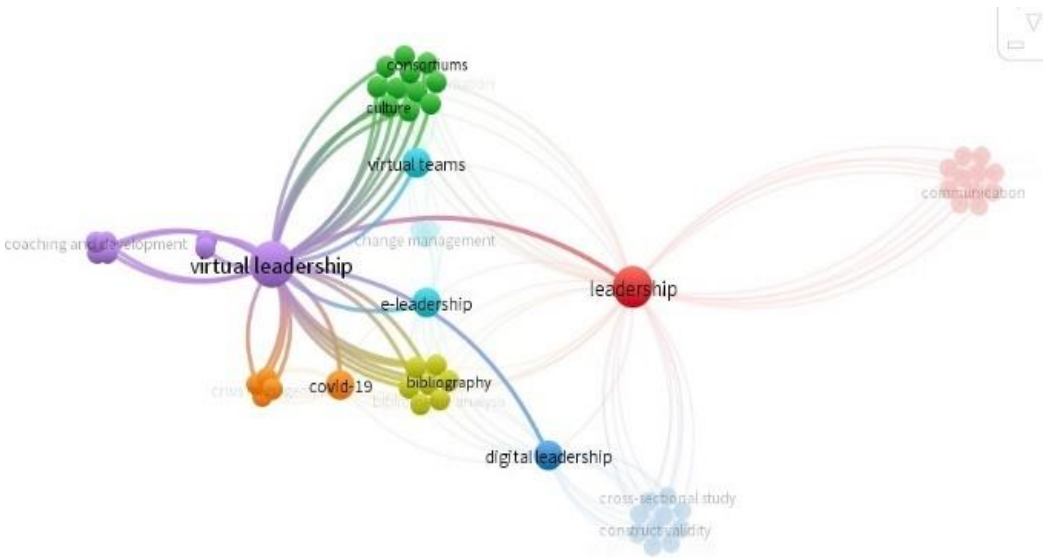

Figure 5. Networks connected with the keyword "Virtual Leadership": Source: Vos Viewer, 2024

Based on Figure 4 related to the findings of the analysis on density visualization, the variable that arises is virtual leadership several articles mapped, where researchers want to see a networked

relationship with virtual leadership variables. The findings of keywords that arise show that these keywords are indeed a trend to be researched and associated with various topics (van Eck & Waltman, 2010). Based on the findings in Figure 5 show network relationships that are interrelated with virtual leadership variable nodes. Some keywords related to virtual leadership are virtual teams, e-leadership (Subrahmanyam, 2023), digital leadership, leadership 4.0 (Karakose et al., 2022), leadership, and leadership behavior (Appelgren, 2022). In implementing virtual leadership, several indicators are realized according to the literature that there must be one, e-leadership explained that to make digital leadership, especially facing the VUCA era which is all virtual, a leader must have characteristics including interactive leadership approaches, collaborative, intact and social, inspiring and open and can foster resilience (Subrahmanyam, 2023). Some of these characteristics if applied to leadership virtually or digitally will be able to affect the progress of the work process (Karakose et al., 2022; Subrahmanyam, 2023).

In addition to these characteristics, virtual leadership must be supported by leadership trust (Turesky et al., 2020) and the formation of virtual teams (Subrahmanyam, 2023). Virtual team support can be done by forming good relationships with the team, communicating transparently with the team, transparent in sharing information, resolving conflicts promptly, training and guiding employees, being consistent in the organization, high performance (Subrahmanyam, 2023; Turesky et al., 2020). With the virtual team, the virtual leadership process will be achieved. Furthermore, the virtual leadership keyword network is also connected to the coaching and development keyword (Turesky et al., 2020), distance learning, dan culture. Training and development in this case focuses on conflict management in an organization to lead to better performance results and realize virtual leadership. In addition, there is a need for virtual work management training so that all actors or workers can adapt to the current uncertainty of globalization (Turesky et al., 2020; Willermark & Islind, 2022). Based on this, realizing virtual leadership is not easy but can be started by paying attention to needs and patterns in work.

Bibliographic competitive organizational culture

The sub-category of competitive organizational culture based on the findings of articles that have been mapped in the bibliography produces 5 group clusters that are identified accordingly in the following figure:

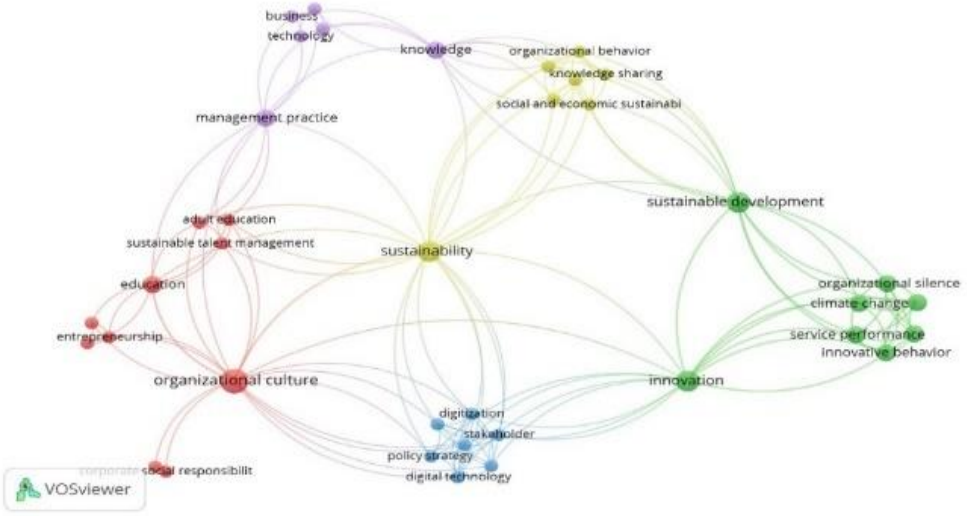

Figure 6. Network Visualization by Vos Viewer, 2024: Source: Data processed by researcher, 2024

The results show cluster 1 with a red network. The keywords that appear are adult education, corporate social response, corporate sustainability, education, entrepreneurship, gender, knowledge management (Marković et al., 2022), organizational culture (Marković et al., 2022; Martínez-Peláez et al., 2023; Saleh & Atan, 2021; Siyal et al., 2022), sustainable talent management (Saleh & Atan, 2021).

Cluster 2 with green network with keywords climate change, innovation, innovative behavior, organizational climate, organizational silence, service performance, social capital (Quan et al., 2023), sustainable development.

Cluster 3 appears with a blue network with keywords digital technology, ICT, management, policy strategy, stakeholders (Martínez-Peláez et al., 2023), technology adoption, and digitization.

Cluster 4 is shown with a yellow network. Keywords that appear include knowledge sharing, organizational agility, organizational behavior, organizational sustainability, social and economic sustainability, sustainability, and sustainable organization (Marjerison et al., 2022).

Cluster 5 with purple network. Keywords that appear include competitive advantages, culture, technology (Fernandez-Jardon et al., 2020), knowledge, management practice, culture, knowledge, management practice (Marković et al., 2022), and business.

The keywords that appear in each cluster show words that are often used in previous research. Furthermore, the results of the analysis that connects organizational culture variables will be seen in the connection of connected variables as shown in Figure 7.

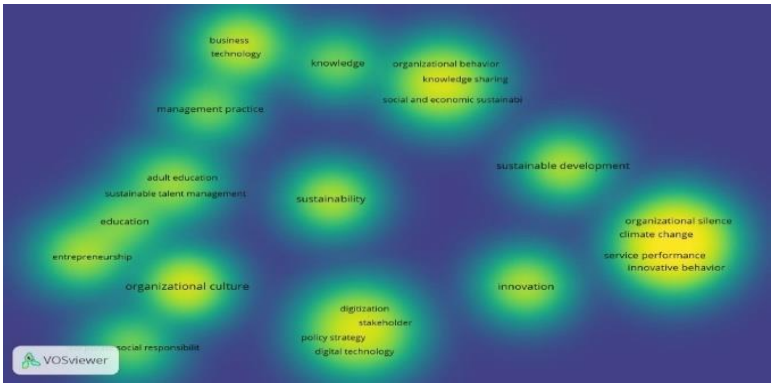

Figure 7. Density Visualization by Vos Viewer, 2024: Source: Data processed by researcher, 2024

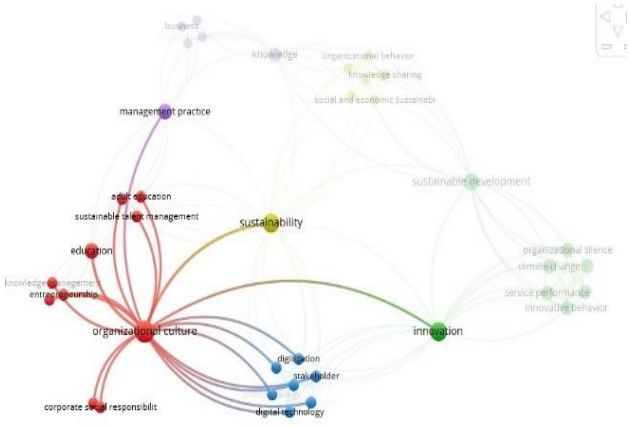

Figure 8. Connected organizational culture variable connections: Source: Vos viewer, 2024

Based on Figure 7, the keyword organizational culture arises in the findings of the analysis. These results show that organizational culture is a research trend (van Eck & Waltman, 2010). In Figure 8 you can see the connection of variables connected to the keyword organizational culture. In the application of a competitive organizational culture, continuous talent management is required. Sustainable talent management practices are primarily aimed at attracting talent, sharing knowledge, training employees, and self-development (Saleh & Atan, 2021). In addition, knowledge management and education are also needed in supporting a competitive work culture in the current VUCA era, If the organization does not provide optimal conditions for quality knowledge management or if the identified employee skill development needs are not seen as important for organizational development, then it is unlikely that positive results will occur, both at the individual and organizational level (Marković et al., 2022). The connection to variable innovation also shows that a competitive organizational culture requires innovation in the VUCA era. The spirit of innovation is operationally defined as "the behavior of adopting, disseminating, and implementing new ideas (Quan et al., 2023). Node management practice is also connected to organizational culture variables. To move towards a competitive organizational culture talent management practices are required including talent attraction, knowledge sharing, employee training, and career development (Saleh & Atan, 2021).

Corporate social responsibility (CSR) nodes also appear in networks related to organizational culture. Companies must be involved in the implementation of CSR activities appropriately by considering stakeholder groups (society, consumers, and employees) (Siyal et al., 2022). Digitization, digital technology is one of the variables that is also connected to organizational culture. Culture can influence the behavior of human resources in the process of technology adoption (Fernandez-Jardon et al., 2020; Martínez-Peláez et al., 2023). On the other hand, technological knowledge influences culture by encouraging innovation and motivating people to change. Organizational culture can drive technology adoption. Culture is usually a source of competitive advantage. Digital technology or ICT can be used as an innovation in business processes, providing sustainability benefits for all parties (Martínez-Peláez et al., 2023).

Virtual Leadership Model and Competitive Work Culture in the VUCA Era

The changing landscape of technological innovation has placed virtual leadership and leadership creatively in a new context, contributing to the development of e-leadership (Y. Wang & Wang, 2022). Since there is a VUCA era that has a lot of uncertainty about world developments, leadership must indirectly be able to face and follow the flow of technology. In response to the impact of digital communication and digital networks, e-leadership is defined as a process of leading that involves social influence in both the proximal and distal environments, leading to changes in behavior, attitudes, feelings, thoughts, and performance because of progress.

With the advent of information technology, organizations have undergone significant transformations, resulting in the creation of virtual teams (Subrahmanyam, 2023; Y. Wang & Wang, 2022). With the help of media technology, virtual teams have evolved into a widely accepted work style that goes beyond cost-saving solutions to overcome geographic distance and time constraints (Subrahmanyam, 2023; Turesky et al., 2020; Y. Wang & Wang, 2022; Willermark & Islind, 2022).

Some of the selected literature mapped out in bibliographic analysis shows a variety of ways to discover how virtual leadership can be adopted and adapted today. Based on the results of the bibliometric analysis, the findings of issues related to the virtual leadership model can be related to what happens in the field, especially where a leader always upgrades and directs the team and its performance, therefore some points of findings of the virtual leadership model What should be applied based on the findings of the bibliometric analysis and based on the fact of findings in the literature is presented in the following table:

Table 2. Findings from the analysis of the virtual leadership model

Applied Model Indicators	Deployment Details
Behavioral Leadership	Personal contact between employees and leaders (Appelgren, 2022), The importance of building trust in the early stages of team development for virtual (Turesky et al., 2020)
Agile and creative leadership	good adaptability to the speed of changing work processes (Claassen et al., 2021), Leaders must be open to ingenious thinking (Subrahmanyam, 2023; Turesky et al., 2020)
Clear communication at work	individual management and the ability to handle a diverse group of individuals (Karakose et al., 2022; Subrahmanyam, 2023), and Digital Communication Skills (Y. Wang & Wang, 2022).
Leaders who can keep up with the flow of technology	Digital knowledge and literacy knowledge of possible changes related to digitalization (Claassen et al., 2021), Digital leadership is a new leadership style associated with Industry 4.0 (Karakose et al., 2022)
Virtual team support	Spatially it can help communicate over long distances (Appelgren, 2022; Karakose et al., 2022), The existence of virtual reality (Karakose et al., 2022; Subrahmanyam, 2023; Willermark & Islind, 2023), Practice virtual motivation techniques to inspire employees even in a virtual environment (Appelgren, 2022)

Source: Data processed by researchers, 2024

Leadership in virtual groups will likely play an important role functioning in aiding the development of trust among virtual staff members (Subrahmanyam, 2023). When group trust is established, the type of electronic leadership that has the most beneficial effects at different stages of the virtual group progress cycle is determined. Leaders tend to agree most with interpersonal claims, which can be attributed to the nature of these crises; they also agree with cultural norms about how to behave as leaders in general (Appelgren, 2022). In addition, a clear understanding of the appropriate practices that leaders use to build trust between leaders and members and resolve conflicts at the individual and team levels has not yet emerged. With VT constantly evolving, practitioners and managers must understand the optimal strategies to drive their VT performance (Turesky et al., 2020).

Experts describe "digital communication skills" for leaders in the digital environment as "the ability to communicate through information and communication technology in a clear and organized manner, avoid mistakes and misunderstandings, and not overestimate or underestimate the performance of others (Y. Wang & Wang, 2022). As an important communication task in the creation process, creative leaders must accurately communicate project content, goals, and strategic plans to team members. Vague task descriptions tend to stifle creativity and reduce intrinsic motivation (Karakose et al., 2022; Subrahmanyam, 2023). Today's leaders can quickly and easily prepare multimedia project summaries using a variety of office software. Compared to verbal communication, written summaries excel at identifying important information, providing an overview of the task, and inserting reference images or videos to aid understanding.

Concerning the concept of Virtual Teams and virtual leadership, the term virtual work has long been popular in the business world since the development of communication technology (Karakose et al.,

2022; Willermark & Islind, 2023). The increasing popularity of virtual teams in contemporary organizations has been achieved by successfully structuring work between teams, increasing competition, and thus reducing costs. However, some weaknesses of Virtual Teams are also noticed. For example, the lack of supervision and control in the virtual environment, the difficulty of keeping up with the flow in the virtual environment, and fluctuations in employee commitment to the organization, which are characterized by more freedom, are mentioned among these difficulties (Karakose et al., 2022). To address these challenges, virtual leaders build trust by using communication technology, valuing diversity, monitoring team progress using technology, and managing virtual meetings.

Virtual leadership is accelerating. The difficulties caused by the separation of time and space in virtual teams require leaders to acquire effective management skills in a virtual environment because leadership plays an important role in overcoming the challenges faced by virtual teams and realizing their potential benefits (Karakose et al., 2022). A need to align mentoring, training, and education strategies with corporate objectives to enable the adoption of new e-leadership approaches. As organizations continue to navigate the complex technological landscape, the development of electronic leadership skills in the 21st century is becoming essential to effectively manage changes in team, process, and knowledge management capabilities (Subrahmanyam, 2023). From our findings, it appears that virtual leadership does require new features, and the work of leaders has changed drastically. We want to illustrate these changes and the following characteristics of changes through the lens of affordability (Karakose et al., 2022; Willermark & Islind, 2023).

Meanwhile, in a competitive work culture in the current VUCA era. Organizational culture determines the path that each company considers to control its work, which, as a result, has an impact on its procedures (Saleh & Atan, 2021; Siyal et al., 2022). Based on the findings of the mapped literature, researchers found issues that support the successful application of competitive organizational culture as follows:

Table 3. Findings of competitive organizational culture analysis

Applied Model Indicators	**Application in detail**
Sustainable Talent Management	Talent attraction, knowledge sharing, employee training, and career development (Saleh & Atan, 2021), Organizations that nurture tomorrow's leaders, managers, and employees (Saleh & Atan, 2021; Siyal et al., 2022).
Inovation	A supportive climate, social capital that stands as a concept of innovation (Fernandez-Jardon et al., 2020; Quan et al., 2023), behavior of adopting, disseminating, and implementing new ideas (Quan et al., 2023), Companies must create a positive organizational voice and environment, reduce silence on organizational members, and encourage employees to actively express their opinions (Marjerison et al., 2022; Quan et al., 2023).
Organizational Agility	Environmental changes that impact the organization), capabilities, supports, and dimensions (the part of the organization that must be met), agile to achieve OA such as management, technology, and labor) (Marjerison et al., 2022), dexterity acts as a

Applied Model Indicators	**Application in detail**
	mediator related to the company's performance (Marjerison et al., 2022; Martínez-Peláez et al., 2023), adaptable, agile, and innovative management model (Martínez-Peláez et al., 2023)
Corporate Social Responsibility	CSR is an important predictor of the Company's success (Siyal et al., 2022) and, an integral part of contributing to the company's performance (Martínez-Peláez et al., 2023; Siyal et al., 2022).

Source: Data processed by researcher, 2024

Organizational agility is categorized into four drivers: drivers (environmental changes that impact the organization), capabilities (the organization's ability to handle change), supporting (tools, practices, and technology), and dimensions (the part of the organization that must be met). agile to achieve OA such as management, technology, and labor) (Marjerison et al., 2022). Talent management refers to the many activities carried out by employees in an organization such as recruiting, retaining, motivating, training, and developing talented individuals for the institution to remain competitive in the market (Saleh & Atan, 2021). As institutions are built to remain competitive and survive in the industry, they need to have solid departments in place to help them attract, retain, motivate training and develop talented people, i.e. talent managers (Marković et al., 2022). Talent management can be defined as a tool to benefit employees by developing their skills and abilities to meet specific needs, as well as by managing future developments. To retain workers in the organization, it is beneficial to help employees develop their skills and abilities. Many reasons can help companies to exploit talent management. Innovation-based change in organizational behavior is closely related to organizational agility driven by knowledge sharing (Marjerison et al., 2022; Quan et al., 2023).

When technology and organizational culture are combined with the help of education and training, their application will increase, and the benefits will be greater. An organizational structure that includes groups and units that create shared norms, beliefs, and practices that must be followed by individuals working within the organization can lead to CSR activities. It is considered as an organizational culture that facilitates an organization's strategy to gain a sustainable competitive advantage by adopting appropriate CSR activities (Martínez-Peláez et al., 2023).

Based on these findings related to virtual leadership patterns and competitive organizational culture, researchers produced virtual leadership models and competitive organizational cultures that can be applied in the current VUCA era. Changes in global technological flows that occur rapidly and are influenced by unexpected factors today cause the VUCA era (Coronado-Maldonado & Benítez-Márquez, 2023). This era indirectly triggers changes in leadership patterns and organizational culture. Virtual leadership is one solution that leaders worldwide can apply to adapt to the flow of change globally. Virtual leadership offers an agile, creative, and trustworthy leadership model. This will encourage leaders to respond to change, including intense communication, technology adjustments, and the formation of virtual teams. In addition to virtual leadership, more competitive organizational changes are needed to face the current VUCA era. The findings show that an agile organizational culture with an organizational culture response scheme that includes continuous talent management, innovation, and CSR will help the organizational sector to be able to adapt to the current VUCA era. The findings can be illustrated in Figure 9 of the model.

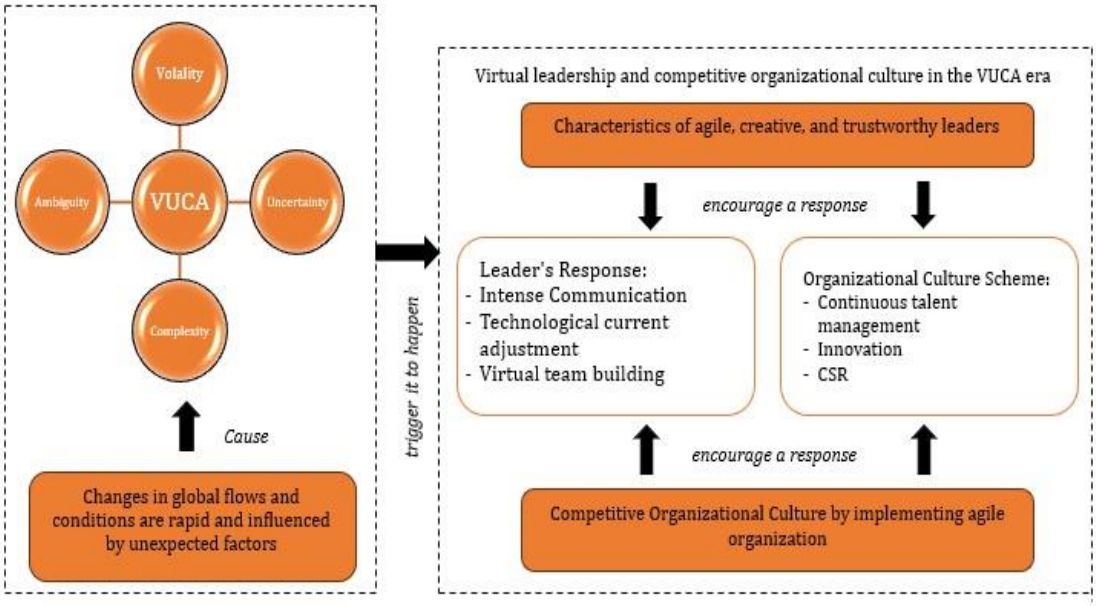

Figure 9. Virtual leadership models and competitive organizational culture in the VUCA era. Source: Data processed by researchers, 2024

CONCLUSION

The VUCA era is when all sectors of the organization must quickly respond to changes. Virtual leadership and a competitive organizational culture will help organizations adapt to the current era. The findings show that virtual leadership can be a solution in facing the VUCA era. Virtual leadership in an agile, creative, and trust-applying way is believed to help succeed in realizing an organization that can face the uncertainty of globalization flows. The leader's response needed in realizing virtual leadership includes intense communication between leaders and members, technology adjustments that can follow global flows and current technology usage trends, and the formation of virtual teams that will be a liaison between teams and help reduce operational costs. With the response of these leaders and the implementation of some of these methods, virtual leadership is believed in the VUCA era. In addition to virtual leadership, support from organizational culture change is also decisive in organizations' success in adapting to the VUCA era. A competitive organizational culture will help implement and adjust how appropriate management is to deal with these uncertain global currents. The findings show that a competitive organizational culture by implementing an agile organization will help formulate agile cultural responses appropriately. Some competitive organizational culture schemes that can be carried out include continuous talent management that will help train, motivate, and develop employees.

In addition, innovation and CSR are essential predictors of a company's success. From these findings, a virtual leadership model and competitive organizational culture were produced so that it can be a solution to face the challenges that occur in the current VUCA era. The limitation of this study is that focusing only globally does not lead to one sector of the organization. Therefore, the researcher provides recommendations for future researchers to identify how virtual leadership and organizational culture occur in the public and government sectors.

REFERENCES

Alfiani, H., Aditya, S. K., Lusa, S., Sensuse, D. I., Putro, P. A. W., & Indriasari, S. (2024). E-Government Issues in Developing Countries Using TOE and UTAUT Frameworks : A Systematic Review. *Policy & Governance Review*, *8*(2), 169–191. https://doi.org/https://doi.org/10.30589/pgr.

v8i2.932
Alon, I., Lankut, E., Gunkel, M., Munim, Z. H., Taras, V., & Richter, N. F. (2023). Predicting leadership emergence in global virtual teams. *Entrepreneurial Business and Economics Review*, *11*(3), 7–23. https://doi.org/10.15678/EBER.2023.110301
Appelgren, E. (2022). Media Management During COVID-19: Behavior of Swedish Media Leaders in Times of Crisis. *Journalism Studies*, *23*(5–6). https://doi.org/10.1080/1461670X.2021.1939106
Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007
Ashiq, M., Ur Rehman, S., Ahmad, N., Atoum, I., Aqil, M., & Ahmad, S. (2023). A Bibliometric Review of Leadership Literature in Library and Information Science Profession, 1959–2022. *SAGE Open*, *13*(4), 1–15. https://doi.org/10.1177/21582440231208767
Bennett, N., & Lemoine, J. (2014). What a Difference a Word Makes: Understanding Threats to Performance in a VUCA World. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2406676
Carrera-Rivera, A., Ochoa, W., Larrinaga, F., & Lasa, G. (2022). How-to conduct a systematic literature review: A quick guide for computer science research. *MethodsX*, *9*, 101895. https://doi.org/10.1016/j.mex.2022.101895
Claassen, K., Rodil, D., Kettschau, J., & Broding, H. C. (2021). *How to evaluate digital leadership : a cross-sectional study*. 1–8.
Codreanu, A. (2016). A VUCA Action Framework for a VUCA Environment. Leadership Challenges and Solutions. *Journal of Defense Resources Management*, *7*(2), 31–38.
Coronado-Maldonado, I., & Benítez-Márquez, M. D. (2023). Emotional intelligence, leadership, and work teams: A hybrid literature review. *Heliyon*, *9*(10). https://doi.org/10.1016/j.heliyon.2023.e20356
Davidaviciene, V., & Al Majzoub, K. (2022). The Effect of Cultural Intelligence, Conflict, and Transformational Leadership on Decision-Making Processes in Virtual Teams. *Social Sciences*, *11*(2). https://doi.org/10.3390/socsci11020064
Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070
Drljevic, N., Aranda, D. A., & Stantchev, V. (2022). An Integrated Adoption Model to Manage Blockchain-Driven Business Innovation in a Sustainable Way. *Sustainability (Switzerland)*, *14*(5), 1–21. https://doi.org/10.3390/su14052873
Econ, C. (2022). Estrategias competitivas internacionales e identidad corporativa de la Universidad Técnica de Machala, Ecuador. *Revista de Ciencias Sociales*. https://doi.org/10.31876/rcs.v28i.38856
Fernandez-Jardon, C., Martinez-Cobas, X., & Martinez-Ortiz, F. (2020). Technology and culture in subsistence small businesses. *Sustainability (Switzerland)*, *12*(22), 1–13. https://doi.org/10.3390/su12229694
Guleria, D., & Kaur, G. (2021). Bibliometric analysis of ecopreneurship using VOSviewer and RStudio Bibliometrix, 1989–2019. *Library Hi Tech*, *39*(4), 1001–1024. https://doi.org/10.1108/LHT-09-2020-0218
Hamid, D. S. (2019). The Strategic Position of Human Resource Management for Creating Sustainable Competitive Advantage in the VUCA World. *Journal of Human Resources Management and Labor Studies*, *7*(2). https://doi.org/10.15640/jhrmls.v7n2a1
Karakose, T., Kocabas, I., Yirci, R., Papadakis, S., Ozdemir, T. Y., & Demirkol, M. (2022). The Development and Evolution of Digital Leadership: A Bibliometric Mapping Approach-Based

Study. *Sustainability (Switzerland)*, *14*(23). https://doi.org/10.3390/su142316171

Kanval, N., Ihsan, H., Irum, S., & Ambreen, I. (2024). Human Capital Formation, Foreign Direct Investment Inflows, and Economic Growth: A Way Forward to Achieve Sustainable Development. *Journal of Management Practices, Humanities and Social Sciences*, *8*(3), 48-61.

Kennedy, P. S. J. (2020). VUCA dalam New Normal. In *New Normal Era* (II, pp. 1–17). Zahir Publishing.

Khananda, R. W. V., Setyawati, S. M., & Purnomo, R. (2024). The Role of VUCA Intelligence in Padang Restaurant Entrepreneurs: Improving Resilience to Maintain Performance During Crisis. *Quality - Access to Success*, *25*(198), 74–85. https://doi.org/10.47750/QAS/25.198.08

Kheng, C. C. S., & Mei, J. S. L. (2023). E-Leadership: Reconceptualising Teacher Leadership in the Singapore Digitised Educational Landscape. *Asia Pacific Journal of Educators and Education*, *38*(2), 23–45. https://doi.org/10.21315/apjee2023.38.2.3

Kim, K. (2022). Supervisor Leadership and Subordinates' Innovative Work Behaviors: Creating a Relational Context for Organizational Sustainability. *Sustainability (Switzerland)*, *14*(6). https://doi.org/10.3390/su14063230

Ma, T.-J., Lee, G.-G., Liu, J., & Lae, R. (2022). Bibliographic coupling: a main path analysis from 1963 to 2020. *Information Research: An International Electronic Journal*, *27*(1). https://doi.org/10.47989/irpaper918

Machado, A. M., & Brandao, C. (2019). Leadership and Technology: Concepts and Questions. *AISC 931*, *1*(March), 567–576. https://doi.org/10.1007/978-3-030-16184-2

Margaret, R. (2010). *Leading Virtual Project Teams: Adapting Leadership Theories and Commication to 21st Century Organizations*. Taylor & Francis Group.

Marjerison, R. K., Andrews, M., & Kuan, G. (2022). Creating Sustainable Organizations through Knowledge Sharing and Organizational Agility: Empirical Evidence from China. *Sustainability (Switzerland)*, *14*(8). https://doi.org/10.3390/su14084531

Marković, M. R., Nikitović, Z., Somborac, B., Penjišević, A., & Vujičić, S. (2022). Integration of Gender Aspects into Development of Knowledge Management System in the Entrepreneurial Organizations in Serbia. *Journal Women's Entrepreneurship and Education*, *2022*(1–2), 154–169. https://doi.org/10.28934/jwee22.12.pp154-169

Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., Félix, R. A., & Mena, L. J. (2023). Role of Digital Transformation for Achieving Sustainability: Mediated Role of Stakeholders, Key Capabilities, and Technology. *Sustainability (Switzerland)*, *15*(14). https://doi.org/10.3390/su151411221

Muafi, M., & Roostika, R. (2022). *International Journal of Sustainable Development and Planning MSMEs Business Sustainability Models in Indonesia*. *17*(1), 207–217.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. In *The BMJ* (Vol. 372). BMJ Publishing Group. https://doi.org/10.1136/bmj.n71

Pramukti, I., Strong, C., Sitthimongkol, Y., Setiawan, A., Pandin, M. G. R., & Lin, C. (2020). Anxiety and suicidal thoughts during COVID-19 Pandemic: A cross-country comparison among Indonesian, Taiwanese, and Thai university students Corresponding Author: Journal of Medical Internet Research, 0, 1-2. https://doi.org/10.2196/24487

Prakoeswa, C. R. S., Endaryanto, A., Martanto, T. W., Wahyuhadi, J., Rochmah, T. N., & Pandin, M. G. R. (2021). Mapping survey of community satisfaction at an academic hospital in Surabaya. Malaysian Journal of Medicine and Health Sciences, 17(April), 119-122. https://medic.upm.edu.my/upload/dokumen/202104291539042020_0898_32.pdf

Purwanti, O. S., Nursalam, N., Pandin, M. G. R. (2024). Early detection of diabetic neuropathy based on health belief model: a scoping review. Frontiers in Endocrinology, 15, Article 1369699. https://doi.org/10.3389/fendo.2024.1369699

Quan, X., Choi, M. C., & Tan, X. (2023). Relationship between Organizational Climate and Service Performance in South Korea and China. *Sustainability (Switzerland)*, *15*(14), 1–14. https://doi.org/10.3390/su151410784

Rashid, A., Jehan, Z., & Kanval, N. (2023). External Shocks, Stock Market Volatility, and Macroeconomic Performance: An Empirical Evidence from Pakistan. *Journal of Economic Cooperation & Development*, *44*(2), 1-26.

Rohmi, F., Yusuf, A., Fitriasari, R., & Pandin, M. G. R. (2023). Factors Affecting Medication Adherence Among Patient with Schizophrenia: A Literature Review. Malaysian Journal of Medicine and Health Sciences, 19, 180-190.

Roshida, D. S., Paskarini, I., & Martiana, T. (2023). Leadership Style Influence on Nurses' Burnout: A Systematic Review. The Indonesian Journal of Public Health, 18(2), 341–352. https://doi.org/10.20473/ijph.v18i2.2023.341-352

Saleh, R., & Atan, T. (2021). The involvement of sustainable talent management practices on employee's job satisfaction: Mediating effect of organizational culture. *Sustainability (Switzerland)*, *13*(23). https://doi.org/10.3390/su132313320

Septian, E., & Wulandari, S. (2024). *Patterns of Political Communication in Virtual Leadership in Political Parties After the COVID-19 Pandemic*. *13*(2), 373–382. https://doi.org/10.31289/perspektif.v13i2.10772

Septianingrum, Y., Nurjanah, S., Yusuf, A., & Pandin, M. G. R. (2023). Do Self-management Interventions Improve Self-efficacy and Quality of Life in Stroke Survivors? A Systematic Review. Malaysian Journal of Medicine and Health Sciences, 19, 156-163.

Shal, T., Ghamrawi, N., Abu-Tineh, A., Al-Shaboul, Y. M., & Sellami, A. (2024). Teacher leadership and virtual communities: Unpacking teacher agency and distributed leadership. *Education and Information Technologies*, *0123456789*. https://doi.org/10.1007/s10639-023-12446-5

Siyal, S., Ahmad, R., Riaz, S., Xin, C., & Fangcheng, T. (2022). The Impact of Corporate Culture on Corporate Social Responsibility: Role of Reputation and Corporate Sustainability. *Sustainability (Switzerland)*, *14*(16). https://doi.org/10.3390/su141610105

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, *104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Stratone, M. E., Vătămănescu, E. M., Treapăt, L. M., Rusu, M., & Vidu, C. M. (2022). Contrasting Traditional and Virtual Teams within the Context of COVID-19 Pandemic: From Team Culture towards Objectives Achievement. *Sustainability (Switzerland)*, *14*(8). https://doi.org/10.3390/su14084558

Suaedi, F., Raharja, W. T., & Ningrum, A. P. (2023). The Social Embeddedness of Leadership: Unfolding the Trajectories of Individual Policy Capacity in Regional Development in East Java, Indonesia. Millennial Asia. https://doi.org/10.1177/09763996231194741

Subrahmanyam, S. (2023). Navigating Global Leadership Strategies for E-Enabling Technology Deployment. *Journal of Law and Sustainable Development*, *11*(6), 1–19. https://doi.org/10.55908/sdgs.v11i6.1220

Susilawati, D. M., Suryanto, Windijarto. (2021). Transforming the digital leadership to improve public service performance in the COVID-19 outbreak. Economic Annals-XXI, 188(3-4), 31-38. https://doi.org/10.21003/ea.V188-04

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., … Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. In *Annals of Internal Medicine* (Vol. 169, Issue 7). https://doi.org/10.7326/M18-0850

Turesky, E. F., Smith, C. D., & Turesky, T. K. (2020). A call to action for virtual team leaders : practitioner perspectives on trust , con fl ict and the need for organizational support. *Organization Management Journal*, *17*(4), 185–206. https://doi.org/10.1108/OMJ-09-2019-0798

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

Viveiros, N., & Bonomi, A. E. (2020). Novel Coronavirus (COVID-19): Violence, Reproductive Rights and Related Health Risks for Women, Opportunities for Practice Innovation. *Journal of Family Violence*. https://doi.org/10.1007/s10896-020-00169-x

Wang, X., & Zeng, Y. (2017). Organizational Capability Model: Toward Improving Organizational Performance. *Journal of Integrated Design and Process Science*, *21*(1), 5–24. https://doi.org/10.3233/jid-2017-0005

Wang, Y., & Wang, Y. (2022). *Developing Creative Leadership in the Use of Digital Communication Tools : A Psychological Perspective*.

Willermark, S., & Islind, A. S. (2022). Adopting to the virtual workplace: identifying leadership affordances in virtual schools. *Journal of Workplace Learning*. https://doi.org/10.1108/JWL-05-2022-0052

Willermark, S., & Islind, A. S. (2023). *Adopting to the virtual workplace : identifying leadership a ff ordances in virtual schools*. *35*(9), 22–37. https://doi.org/10.1108/JWL-05-2022-0052

Zhao, X., Ren, Y., & Cheah, K. S. L. (2023). Leading Virtual Reality (VR) and Augmented Reality (AR) in Education: Bibliometric and Content Analysis From the Web of Science (2018–2022). *SAGE Open*, *13*(3), 1–23. https://doi.org/10.1177/21582440231190821