Olaleye, S.A. & Adusei, A.G. (2023). Exploring bibliometric perspectives on data culture in scholarly discourse. In Li, E.Y. *et al.* (Eds.) *Proceedings of The International Conference on Electronic Business, Volume 23* (pp. 232-243). ICEB'23, Chiayi, Taiwan, October 19-23, 2023

Exploring Bibliometric Perspectives on Data Culture in Scholarly Discourse

Sunday A. Olaleye [1,*]
Akwasi G. Adusei [2]

*Corresponding author
[1] Senior Lecturer, Jamk University of Applied Sciences, Jyvaskyla, Finland, sunday.olaleye@jamk.fi
[2] Doctoral Researcher, University of Oulu, Oulu Finland, akwasi.adusei@oulu.fi

ABSTRACT

Data culture refers to an organization's prevailing attitudes, beliefs, behaviors, and practices concerning data and its utilization. It encompasses the organization's data collection, analysis, sharing, and decision-making approach. A robust data culture is achieved over time but requires a concerted effort by leadership and employees. This study overviews data culture, encompassing organizations' and institutions' attitudes, behaviors, and data-related practices. It highlights the study's exploration of data culture's dimensions and significance in driving innovation, informed decision-making, and competitiveness. The study mentions the relevance of theories like Schwartz's cultural values in understanding data culture's perception across diverse cultures. The study employed bibliometric analysis to assess data culture research trends and identify gaps. It emphasizes the need for interdisciplinary, global, and longitudinal studies to advance understanding in this field. This study is a comprehensive resource for researchers and practitioners interested in data culture, offering insights and future research directions.

Keywords: Data Culture, Big Data, Open Data, Data Literacy, Taxonomy, Bibliometric

INTRODUCTION

Data culture refers to an organization's prevailing attitudes, beliefs, behaviors, and practices concerning data and its utilization. It encompasses the organization's data collection, analysis, sharing, and decision-making approach. A robust data culture is achieved over time but requires a concerted effort by leadership and employees. It involves fostering a mindset that values data as a strategic asset and recognizes its potential to drive innovation, improve efficiency, and inform strategic planning. A data culture can lead to more informed decision-making, a competitive edge, and better organizational outcomes. Data culture revolves around data awareness, literacy, data-driven decision-making, data collection and quality, data sharing and collaboration, leadership support, data governance, performance measurement, continuous learning, data transparency and data ethics.

The existing literature explores how a data-driven culture within firms impacts their product and process innovation, ultimately leading to improved performance and competitive advantage. The research employs a conceptual model validated with responses from 456 employees using various business analytics tools. The findings emphasize the significant influence of data-driven culture on product and process innovation, enhancing a firm's competitiveness. Leadership support and data-driven culture are moderators, while firm size, age, and industry type are control variables (Chatterjee et al., 2021).

Another study is grounded in organizational information processing theory. It investigates how Big Data Analytics Capability (BDAC) contributes to Green Supply Chain Integration (GSCI), focusing on the role of data-driven decision culture. To validate hypotheses, the study collects two-wave survey data from 317 Chinese manufacturing firms. The results indicate that BDAC positively influences various dimensions of GSCI. Additionally, a data-driven decision culture moderates the relationship between BDAC and green internal integration. The research highlights the potential for firms to leverage BDAC for enhanced GSCI (Liu, Fang, Feng & Gao, 2022).

On the other hand, McCord et al.'s (2021) study addresses the challenge of maintaining data quality in ecological research, particularly in the era of big data. It emphasizes the need for a cultural shift to prioritize data quality as an integral practice in ecological studies. The research introduces a comprehensive data quality framework that can adapt to different collaboration models and ecological data types. This framework aims to foster a culture of data quality in ecological research, ultimately enhancing the reliability and reproducibility of findings. At the same time, the study of Su et al. (2021) concentrates on the adverse effects of secondhand smoke exposure, particularly for expectant mothers in China. It highlights the unique challenges traditional cultural practices pose that may discourage reporting family members' smoking behaviors around pregnant women. The paper proposes an innovative approach to measuring secondhand smoke exposure among expectant mothers in the Chinese context, aiming to improve data accuracy on this critical health issue. The research seeks to inform cancer control measures and reduce cancer risk for expectant mothers in China.

Other studies focus on the data economy through productization and underscore the importance of data access for startups and SMEs, explore the role of data in business decision-making, and emphasize the necessity for further research to bridge the gap

in comprehending the relationship between the data economy and productization. This study adopts a conceptual approach and extends the established theoretical framework of Task-Technology Fit (TTF) (Olaleye & Adusei, 2022a), while Olaleye et al. (2022b) employed quantitative bibliometric analysis of published literature to uncover trends, conceptualization, and future directions in the field of data economy. Using data from 2008 to June 2021 from sources such as Web of Science and Scopus, this study combines FAIR data principles with the data economy, shedding light on its conceptual, intellectual, and social structure and highlighting the strategic importance of data for industry and academia. While offering a steppingstone for future empirical and longitudinal studies, this research emphasizes the relevance of data to society and identifies areas for future exploration in this emerging field.

The Existing research focuses on cultural dimensions and values in health (obesity rates), accounting, entrepreneurship, data economy and work-related contexts but the direct application of these cultural dimensions and values to the domain of "bibliometric data culture" is missing, and there is no mention of how cultural values influence scholarly communication, publishing trends, or citation practices, specifically in bibliometric data culture. While existing research underscores the importance of considering cultural dimensions in various contexts, none explicitly identifies the research gap related to the influence of cultural values on bibliometric data culture. This gap becomes apparent when we realize that, despite the emphasis on culture's impact in other domains, there is a limited exploration of how cultural values affect the scholarly communication landscape, particularly in the context of bibliometric measures.

The study addresses a significant research gap by focusing on the influence of cultural values on scholarly communication activities, publishing trends, citation practices, and dissemination of research findings within the context of bibliometric data culture. Doing so extends the existing literature to a new and critical domain. It leverages cultural psychology, sociology, and data science insights to provide a more holistic understanding of how cultural values intersect with data culture. This interdisciplinary approach allows a richer exploration of the complexities involved.

Understanding the role of cultural values in bibliometric data culture has practical implications for academic institutions, researchers, and funders. It can inform strategies for improving scholarly communication, enhancing the visibility of research findings, and adapting practices that align with cultural values. This study can help international researchers and institutions to navigate cultural differences more effectively. This study of bibliometric data culture addresses a critical research gap by applying insights from cultural values and dimensions to the scholarly communication landscape. This study can potentially advance the research community's understanding of how culture shapes the dissemination of scientific knowledge and can offer actionable insights for stakeholders in academia and research.

Despite the impacts of these academic contributions, more bibliometric studies on data culture still need to be done. Due to this gap, this study intends to investigate the impact of bibliometric data culture on scholarly communication within academic and research communities and answer the following research questions: a). How does the integration of bibliometric data culture influence the behaviors and practices of scholars in terms of their scholarly communication activities, including publishing and citation practices? b). What are the specific trends and patterns observed in scholarly publishing, citation practices, and scholarly communication due to the increasing emphasis on bibliometric measures within academic and research communities? c). How does the prevalence of bibliometric data culture affect the visibility and accessibility of scientific knowledge within scholarly discourse, and how does it impact the dissemination of research findings? These objectives and research questions provide a framework for investigating the role and implications of bibliometric data culture in the scholarly communication landscape. This study gave a theoretical background based on Schwartz's cultural values and follow up with methodology, results, discussion and concluded with theoretical, managerial implications, study limitations and future study.

THEORETICAL BACKGROUND

Schwartz's Cultural Values

Schwartz's theory of basic human values serves as a psychological framework meticulously crafted to decipher the intricacies of human values and their profound influence on behavior, attitudes, and decision-making processes. The cornerstone of this theory is the assertion that a set of universal values lies at the core of human beliefs and behaviors, transcending the boundaries of diverse cultures and societies. Schwartz, the architect of this theory, meticulously identified ten fundamental values, ingeniously organizing them into a circular structure. Individuals, guided by their cultural background, personality, and life experiences, bestow varying degrees of importance upon these values.

Within Schwartz's framework, each value bears unique significance. For instance, self-direction embodies the pursuit of autonomy, creativity, and independent thought, while stimulation embodies the relentless quest for excitement, novelty, and life's challenges. In contrast, hedonism champions the relentless pursuit of pleasure and the cultivation of enjoyable experiences, while achievement places a premium on personal success, competence, and the pursuit of ambitious goals. Power, one of the ten human values, signifies the desire for control, dominance, and influence over others. At the same time, security underscores the importance of safety, stability, and order in an individual's life. Conformity breathes life into human values by representing the desire to adhere to societal norms, rules, and expectations. In contrast, tradition embodies the reverence for preserving cultural and societal traditions and values. As we reach the final stretch, benevolence emerges, grounded in a profound concern for the welfare and well-being of others, and universalism stands tall as the embodiment of a steadfast commitment to social justice, equality, and the welfare of all individuals, often transcending cultural and national boundaries.

Schwartz's theory identifies these ten fundamental values and postulates that they coalesce within a circular structure. This circular arrangement unveils these values' intricate interplay and compatibility, purportedly a universal cultural phenomenon. Two instrumental methods, the Schwartz Value Survey, and the Portrait Values Questionnaire, have been devised to measure these values accurately. Findings from research spanning 82 countries provide compelling evidence to underscore the theory's capacity to transcend cultural boundaries and remain universally applicable (Schwartz, 2012).

The theory posits that these values occupy specific positions within the circular structure, with opposing values at opposite ends of the circle. For instance, self-direction starkly contrasts conformity, while benevolence counters power. This arrangement accounts for the compatibility and conflict between these values. Individuals prioritize these values differently, creating unique value systems that influence their attitudes, behaviors, and decision-making processes. Cultural and social factors, in tandem with personal experiences, play a pivotal role in shaping an individual's value hierarchy. Consequently, Schwartz's theory has been extensively applied in psychology and social sciences. Researchers employ many instruments, including the Schwartz Value Survey (SVS), to assess an individual's value priorities and delve into their far-reaching impact on various aspects of life and society.

In a separate inquiry, scholars delve into the roles played by Schwartz's cultural value types in individual Information and Communication Technologies (ICT) usage across 49 nations. Their research unveils the significant relevance of seven value types in this context. Furthermore, the study reveals that ICT use is more prominent among individuals with higher levels of education, income, employment status, and youth. Additionally, it discerns notable similarities and differences in results between developed and developing nations, thereby shedding light on the profound impact of cultural values on ICT utilization (Bagchi & Kirs, 2009).

Similarly, other researchers explore the complex relationship between obesity rates across various countries and cultural dimensions, such as those delineated by Hofstede and Schwartz, alongside Gross National Income per capita. Their findings illuminate the positive association between individualism and uncertainty avoidance, as per Hofstede's dimensions, and obesity rates. In contrast, long-term orientation exhibits a negative correlation with obesity rates. However, the study does not establish a significant link between Schwartz's cultural values and obesity rates. This research underscores the imperative of considering cultural dimensions when devising strategies to combat obesity (Tekeş et al., 2019). Continuing the trajectory of cultural influences, some scholars seek to uncover the role of cultural conditions, particularly cultural values, in unravelling disparities in accounting practices across nations. In this endeavor, they present typologies of cultural value models put forth by scholars such as Schwartz, Hofstede, and Gray. Furthermore, they elucidate recent studies that employ these frameworks to decipher the profound impact of national culture on the intricacies of accounting practices (Koleśnik, 2013).

Shifting focus, another set of scholars delves into the intricate interplay between individual cultural orientations, rooted in Schwartz's values model, and nascent entrepreneurship. Their investigation reveals that values aligned with open-mindedness and self-direction positively influence nascent entrepreneurship. In contrast, values associated with tradition and security exert a dampening effect on the nascent entrepreneurial spirit. This research sheds light on the multifaceted motivations driving entrepreneurship across diverse cultural landscapes (Alsaad, 2018).

Furthermore, a comprehensive overview of the systematic study of values in psychology emerges. This scholarly exposition, underpinned by Schwartz's theory of basic personal values, delves into the content and structure of values across cultures, the intricacies of measuring values, their origins, and their profound impact on an array of behavioral and societal facets (Sagiv & Schwartz, 2022). In a separate realm, Schwartz (1999) introduces a theory delineating cultural values tailored for cross-cultural comparisons. This theory, substantiated by data from 49 nations, identifies seven types of values distributed along three polar dimensions. These findings provide valuable insights into the cultural value priorities of various nations. Moreover, they rearrange these nations in a two-dimensional space, shedding light on meaningful clusters of culturally akin nations. The research also delves into the far-reaching implications of disparities in cultural values for interpreting the meaning of work. It develops hypotheses that explore the compatibility or conflict between cultural value emphases and work centrality, societal norms regarding work, and the pursuit of various work-related values and goals.

Lastly, Vauclair et al. (2011) conducted a meta-analysis employing the Rokeach Value Survey (RVS) to replicate Schwartz's value structure at the cultural level. Remarkably, their findings confirm the structure of conflicting value types as predicted by Schwartz. Furthermore, they unearth a previously uncharted value type termed Self-Fulfilled Connectedness (SFC). This value type encapsulates profound attachment to others and embodies attributes of self-fulfillment. Impressively, their analysis reveals correlations between SFC and subjective well-being, post-materialism, and socio-economic development indices at the country level. These correlations underscore the connection between SFC and happiness, the pursuit of non-materialistic goals, and the endorsement of values prevalent in societies where basic needs are satisfied. This groundbreaking discovery offers intriguing theoretical perspectives within Schwartz's cultural value theory.

METHODOLOGY

As organizations and institutions advance their data culture, several challenges persist. One significant challenge is the unequal distribution of data literacy and proficiency among employees. While some possess advanced data skills, others struggle to harness the power of data effectively. This study employed quantitative methodology with bibliometric data analysis and inferred from the existing studies of (Olaleye, 2020; Olaleye, 2023) to anatomized data culture with the lens of academic scholars' contributions.

This study's research design and methodology on bibliometric data culture involved a systematic approach with specific criteria and steps for selecting and evaluating academic papers. The study elaborates on the process to provide a clearer understanding. Initially, the study utilized the Web of Science database for data collection. Web of Science is a well-regarded academic database that grants access to various scholarly publications. The search strategy was crafted with precision to retrieve pertinent papers. Specifically, the study used the search string "data culture" (Topic) and established the following criteria:

The data collection took place on July 14, 2023.
The search was limited to articles or proceeding papers (Document Types).
The study considered publications from 1994 to 2023 (Publication Years) for longitudinal exploration.
The language of publication was restricted to English (Languages).

Given the burgeoning nature of the data culture research domain, the primary focus was articles and conference proceedings. Initially, this search yielded 115 academic papers. However, after applying inclusion criteria, which filtered out non-English papers (two papers in Spanish and one in German) and narrowed the publication years to 1994-2023, the dataset was refined to include 95 papers. These 95 papers constituted the basis for the subsequent data analysis, conducted using specialized tools of VOSviewer (Van Eck & Waltman, 2017) and Biblioshiny (Aria & Cuccurullo, 2017).

As a bibliometric analysis tool, VOSviewer allows users to visualize and scrutinize various aspects of academic papers. This process encompassed examining citation networks, co-authorship networks, and keyword co-occurrence, among other facets. Similarly, Biblioshiny, another bibliometric analysis tool, equipped users with features to delve into bibliometric data, facilitating visualization and exploration.

This study aimed to uncover significant insights from the included 95 academic papers. Specifically, the study sought to understand trends and patterns in scholarly publishing related to data culture, assess the frequency of paper citations, scrutinize author affiliations, and identify potential clusters of research interest. This comprehensive approach enabled the study to paint a detailed picture of the bibliometric landscape in data culture. This study design and methodology were meticulously crafted to provide a structured and rigorous approach to studying bibliometric data culture. The systematic selection of papers, coupled with the application of specialized analysis tools, allowed the study to gain valuable insights and contribute meaningfully to understanding this research domain. The below Figure 1 show the framework for the data collection.

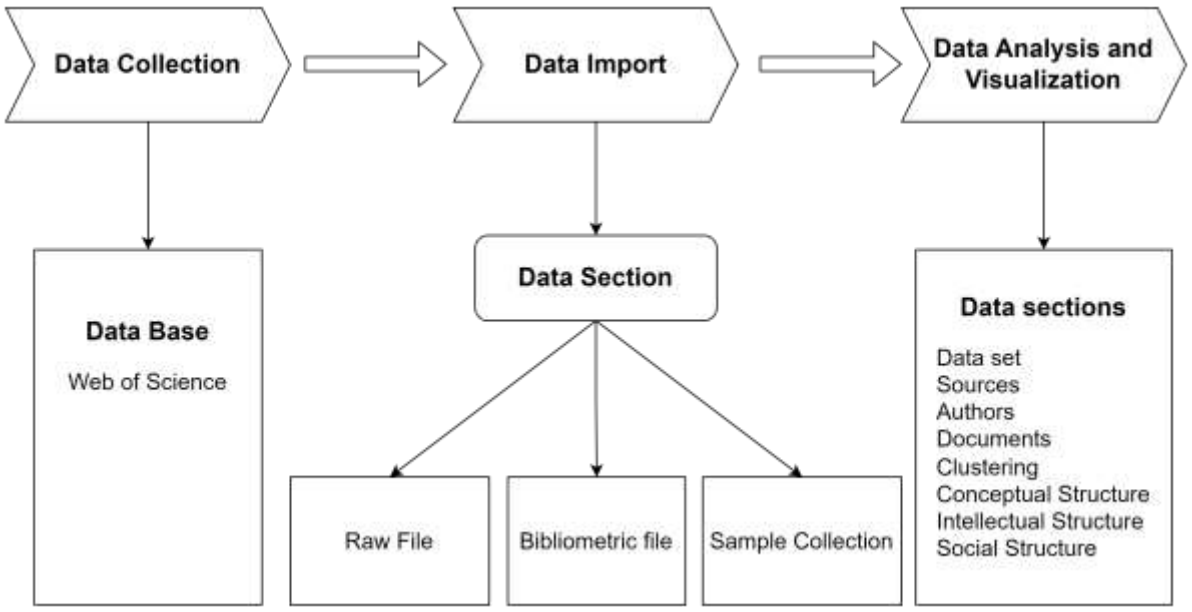

Figure 1: Bibliometric Research Steps Using Biblioshiny and VOSviewer

Figure 2: Descriptive Statistics of Data Culture

RESULTS AND DISCUSSIONS

The descriptive statistics of data culture in Figure 2 show 91 sources of journals and conferences, 95 documents consisting of articles and conferences proceedings with annual growth rate of 4.9%. 377 authors contributed to the body of knowledge while only 16 were single-authored and 21.05% had international co-authorship. As the big data era is advancing, also data culture is becoming more relevant, and it is growing steadily.

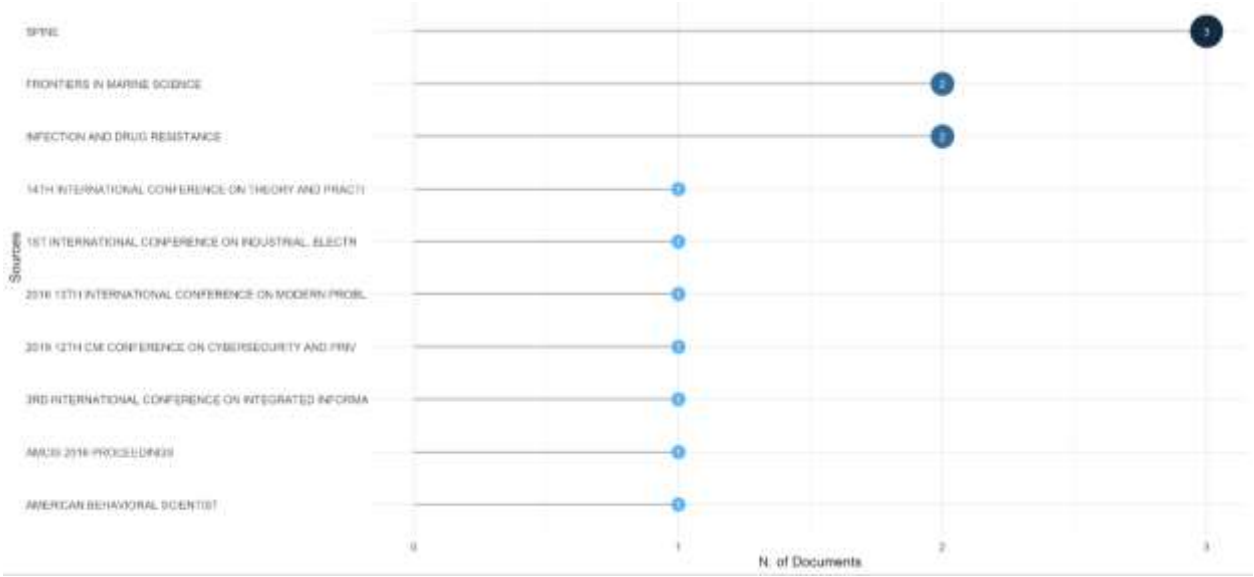

Figure 3: Most Relevant Sources of Data Culture

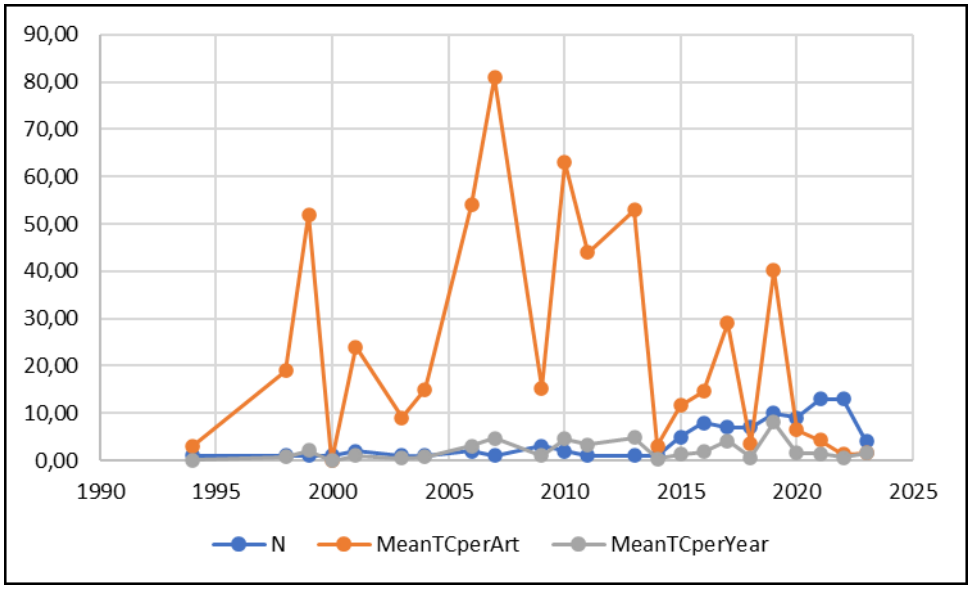

Figure 4: Data Culture publication frequency, mean per article and year

The active authors in the data culture field communicate with their readers through Spine with three publications, Frontiers in Marine Science and Infection and drug resistance with two publications. All the conferences used by the authors and other journals published one paper each (Figure 3). Data culture is a multidimensional field, and its communication diffusion is still at a lower level. Also, as shown in Figure 4, the highest publication of thirteen papers reflected in 2021 and was repeated in 2022. The earlier 1 publication in 2007 recorded 81 mean total citation per article and 4.76 mean total citation per year. In 2010 there were 63 publications with 4.50 mean total citation per article and 8.04 mean total citation per year. Likewise in 2019, there were 10 publications, 40.2 mean total citation per article and 8.04 mean total citation per year.

Based on the chart in Figure 4, the trends and patterns observed in scholarly publishing in the field of data culture are undulating. The publications were at a low level from 1999 to 2014 but there was a little shift in 2015 with five papers and from then till 2022 there was slight increase in publications.

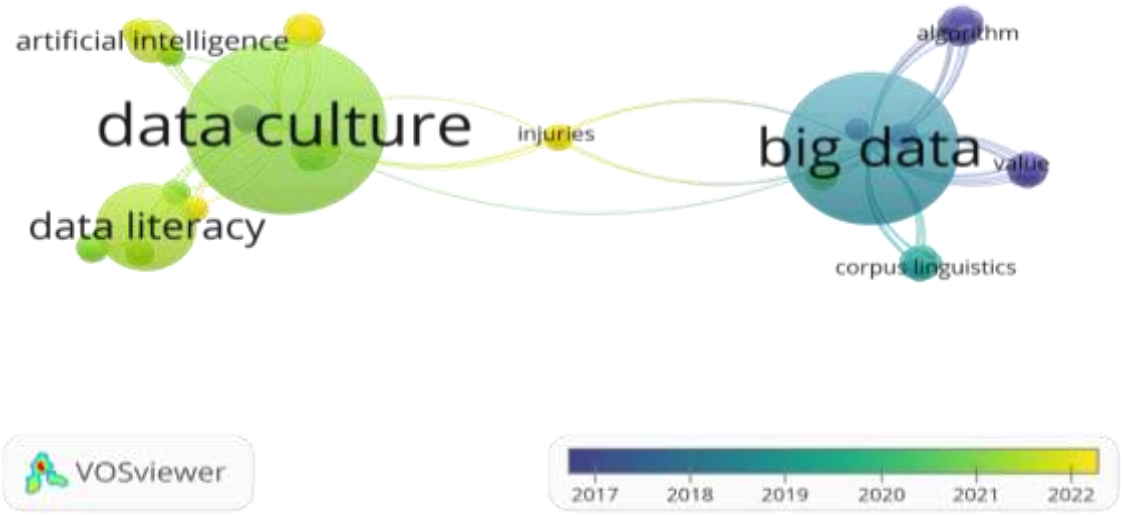

Figure 5: Author's Keywords

Figure 5 shows that the relationship between artificial intelligence (AI), data culture, data literacy, big data, algorithms, corpus linguistics, and injuries can be understood in the context of how these concepts are interconnected and how they can be applied in various domains, including healthcare and injury prevention. Big data are a massive volume of structured and unstructured data from various sources. These data included text, images, videos, and sensor data.

In the context of injuries, big data can be used to collect and analyze large datasets related to injury cases, causes, and prevention methods. These datasets provide valuable insights into injury-prevention strategies. Corpus linguistics is the study of language by analyzing extensive collections of text (corpora). It involves extracting patterns, trends, and information from textual data. In the context of injuries, corpus linguistics can analyze medical records, injury reports, and the healthcare literature to identify common risk factors, trends in injury types, and effective treatments.

AI involves the development of algorithms and models that enable machines to perform tasks that typically require human intelligence such as understanding natural language, making decisions, and recognizing patterns. In the context of injuries, AI can be applied to analyze big data and linguistic corpus datasets. Natural language processing (NLP) techniques can extract valuable information from text data, whereas machine learning models can predict injury risks, suggest preventive measures, or aid in diagnosis and treatment.

Algorithms are step-by-step procedures or rules that are followed to perform specific tasks. For AI and big data, algorithms are crucial for processing and extracting insights from large datasets. In the context of injuries, algorithms can analyze patterns in injury data, identify correlations between factors (e.g., age, location, and activity) and injuries, and develop predictive models for injury prevention.

Data culture refers to the organizational mindset and practices that prioritize the use of data for decision making and problem solving. A robust data culture in healthcare and injury prevention encourages healthcare institutions to collect, share, and analyze data to improve patient care, identify injury trends, and implement evidence-based interventions. Data literacy involves understanding, interpreting, and communicating effectively with data. It involves skills in data analysis, visualization, and data-driven decision-making. Healthcare professionals and researchers need data literacy to understand big data, corpus linguistic analyses, and AI-driven insights related to injuries. Data literacy enables data stakeholders to draw meaningful conclusions and make informed decisions.

The relationship among AI, data culture, data literacy, big data, algorithms, corpus linguistics, and injuries lies in their collaborative use for injury prevention and healthcare improvement. By leveraging AI and data-driven approaches, healthcare researchers can analyze vast datasets, extract valuable insights from textual data, and develop predictive models to reduce the incidence of injuries and enhance patient care. Robust data culture and literacy are essential components of this process, facilitating the effective use of data in healthcare decision-making.

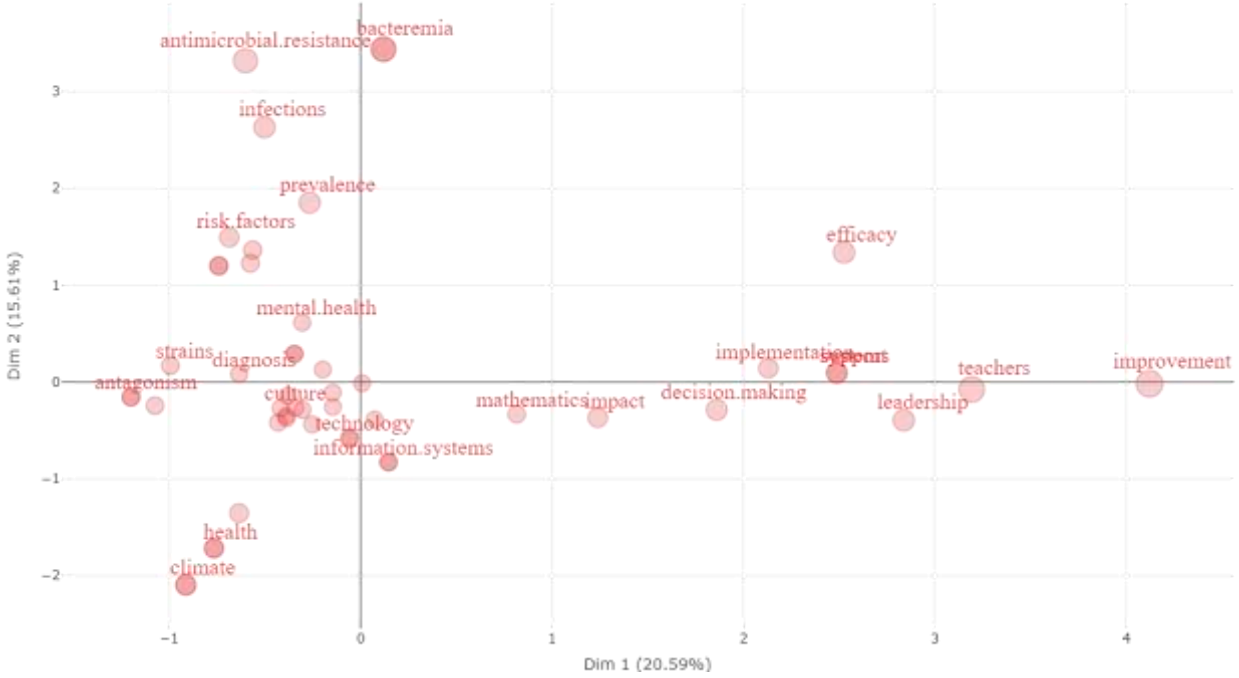

Figure 6: Factorial Analysis (Word Map)

Figure 6 shows the output of a dimensionality reduction technique such as factorial analysis, which reduces the dimensionality of a dataset while retaining the most essential information. Figure 6 depicts the words, and the dimensions (Dimensions 1 – horizontal axis and 2 – vertical axis) represent two new orthogonal variables that capture the variance in the original data. Dims 1 and 2 represent the extent to which each word is positively or negatively associated, respectively. Words with positive values were positively associated with Dim 1 and 2, whereas words with negative values had a negative association.

The word map shows that teachers, improvement, leadership, efficacy, government, and implementation had strong positive associations with both dimensions. In contrast, climate, injuries, health, big data, and frameworks had strong negative associations with both dimensions. Positive and negative associations indicate how strongly each word contributes to the dimensions. These results can clarify which words or concepts are related or distinct in the employed dataset, which can be applied in various fields, such as text analysis, natural language processing, and topic modelling.

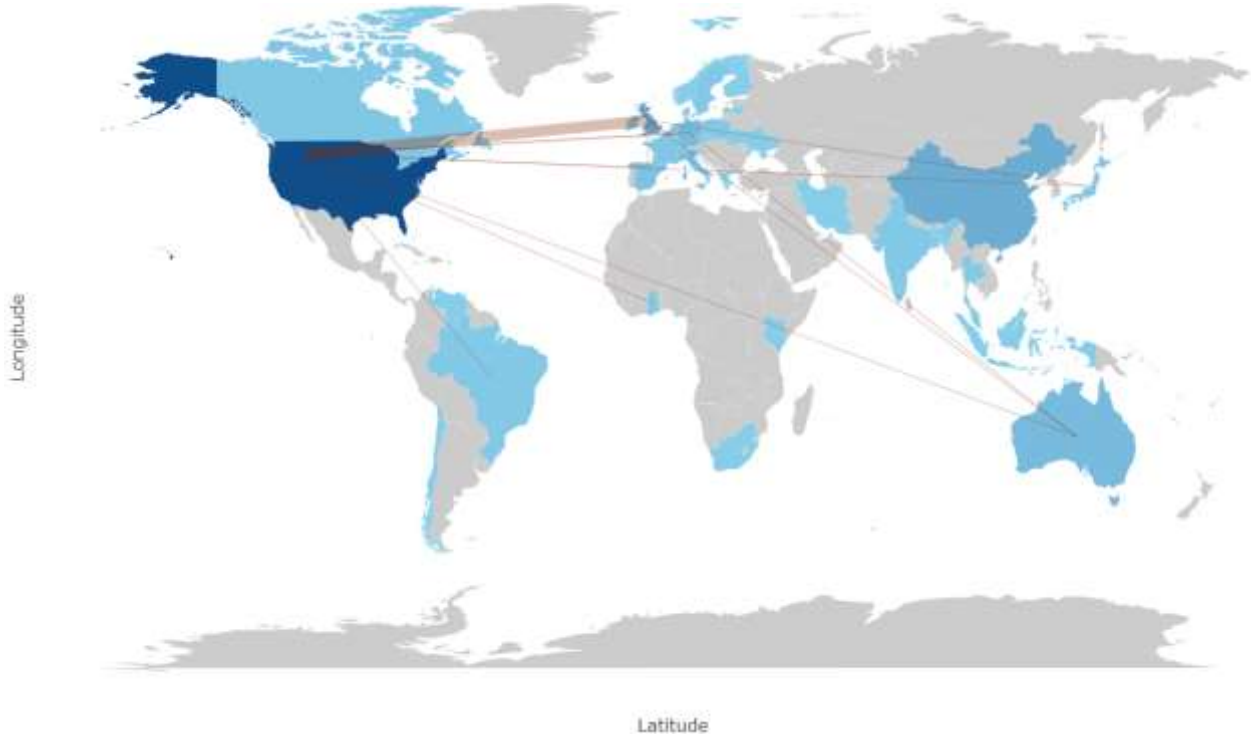

Figure 7: Countries' Collaboration World Map of Data Culture

Figure 7 shows the countries' collaboration in data culture, and the results represent international connections or relationships between various countries, along with the frequency of their connections. Australia had international collaborations with ten countries in data culture, including Belgium, Belize, Germany, Japan, Kenya, Norway, Qatar, Singapore, Sweden, and Venezuela. Australia's collaboration was intercontinental. Further, Belgium collaborated with eleven countries: Belize with Qatar and Venezuela, Brazil with Chile, and the Czech Republic. Canada has four countries, South America and Europe. Denmark worked with Switzerland, France, and Germany in three different countries, Italy in Spain, Japan in four countries, and Kenya in five. The Netherlands has six countries: Poland with two, Qatar with Venezuela, Singapore with three, and Sweden with Norway.

The United Kingdom and the United States of America (USA) have notable connections with a frequency greater than one collaborator. For instance, the United Kingdom had 16 collaborators once, except for Australia, Belgium, France, and Japan, with two frequencies. Likewise, the USA had higher collaborators of twenty-four. The USA had the highest collaboration with the United Kingdom, six times. These results provide insights into the frequency and nature of connections between countries, which can be valuable in understanding international relationships and collaborations.

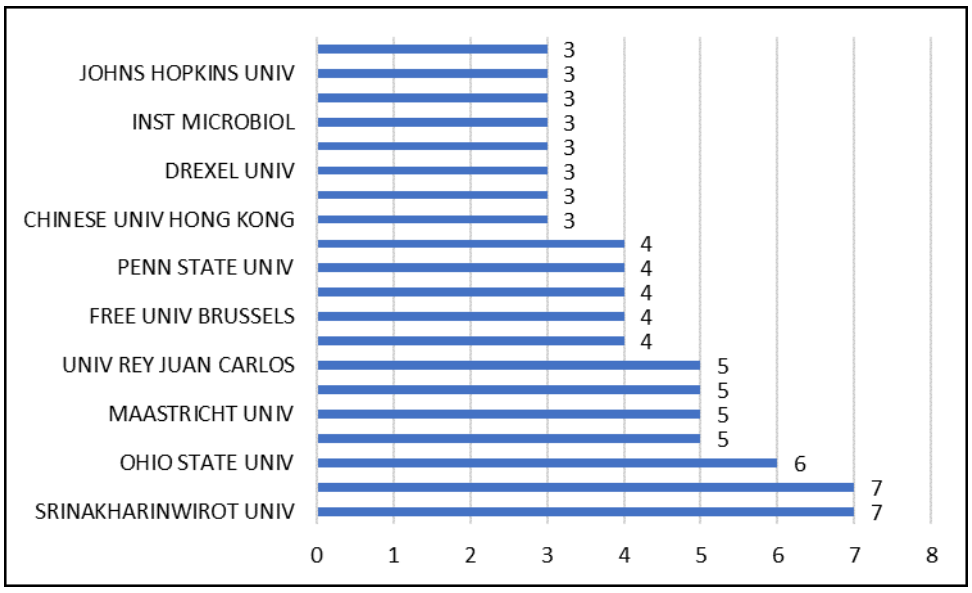

Figure 8. Affiliation of Data Culture Authors

Author's affiliation is one way to examine the visibility and the accessibility of scientific knowledge in the field of data culture. Ohio State University, United States of America and Srinakharinwirot University in Thailand top the list of affiliation with 7 publications each. Other universities followed in turn with 5, 4 and 3 publications. For visibility and the accessibility of scientific knowledge in data culture, there are a lot of gaps as the frequency of publication needs more attention (Figure 8).

Table 1: Corresponding Author's Countries

Country	Articles	SCP	MCP	Freq	MCP_Ratio
USA	28	23	5	0.295	0.179
China	10	9	1	0.105	0.1
United Kingdom	7	6	1	0.074	0.143
Italy	5	5	0	0.053	0
Netherlands	4	2	2	0.042	0.5
Spain	4	2	2	0.042	0.5
Australia	3	2	1	0.032	0.333
Denmark	3	2	1	0.032	0.333
Germany	3	3	0	0.032	0
Belgium	2	2	0	0.021	0
Canada	2	2	0	0.021	0
France	2	1	1	0.021	0.5
Ghana	2	0	2	0.021	1
India	2	2	0	0.021	0
Sweden	2	1	1	0.021	0.5
Switzerland	2	2	0	0.021	0
Thailand	2	2	0	0.021	0
Bangladesh	1	0	1	0.011	1
Finland	1	1	0	0.011	0
Greece	1	1	0	0.011	0
Indonesia	1	1	0	0.011	0
Iran	1	1	0	0.011	0
Kenya	1	0	1	0.011	1
Latvia	1	1	0	0.011	0
Malaysia	1	0	1	0.011	1
Poland	1	1	0	0.011	0
South Africa	1	1	0	0.011	0
Ukraine	1	1	0	0.011	0

Note: SCP: Single Country Publications. MCP: Multiple Country Publications

Table 1 contains information about countries, number of articles published (articles), number of single-authorized publications (SCP), number of multi-authorized publications (MCP), frequency of publications (Freq), and MCP _ Ratio (MCP_Ratio). The table lists the names of the various countries involved in data culture publications, the number of articles published by researchers from each country, the number of articles in which a single author from that country was involved in the publication, and the number of articles where multiple authors, including at least one author from that country, were included in the publication. The frequency of publications in Table 1 was calculated as the number of articles divided by the total number of articles in the table. This column shows the relative contribution of each country to the total number of articles, while the ratio of multi-authored publications depicts the multi-country publications divided by articles. This indicates how many researchers from a particular country collaborate with researchers from others.

This study shows that the USA has the highest number of articles (28) and a relatively high frequency of publications (0.295). Most of its publications involved multiple authors, with an MCP ratio of 0.179. China has ten articles, with a lower frequency (0.105) than the USA. However, it had a relatively high MCP ratio (0.1), indicating significant collaboration in its publications. With seven articles, the United Kingdom had a moderate frequency (0.074) and an MCP ratio of 0.143, indicating a fair amount of collaboration in its publications.

Italy, the Netherlands, Spain, Australia, and Denmark had lower article counts (ranging from three to five), and their frequencies and MCP ratios varied. Italy has a high SCP count (indicating more single-authored publications), while the Netherlands and Spain have equal numbers of SCP and MCP. Australia and Denmark have similar profiles, with moderate frequencies and MCP ratios. In contrast, Ghana, Bangladesh, Kenya, and Malaysia have lower article counts (1 or 2), but tend to have high MCP ratios, suggesting a strong tendency for collaborative multi-authored publications. Several countries have only one article each with varying SCP and MCP ratios. Some have no multi-authored publications (MCP ratio of 0), whereas others have a balanced mix of single and multi-authored publications.

These findings provide insights into the publication patterns of different countries, highlighting variations in the number of articles, collaboration tendencies, and the balance between single- and multi-author publications. This study revealed that collaboration in multi-authored publications is a common practice, with some countries having a higher propensity for such collaborations.

CONCLUSIONS

Theoretical Contribution to Data Culture

Schwartz's Cultural Values Theory significantly enriches our understanding of the research needs related to data culture. This theoretical framework plays a pivotal role in identifying critical areas of inquiry, shedding light on cultural influences, and shaping the research trajectory in this domain. Schwartz's theory has left an indelible mark on the formation of these research needs. Schwartz's theory highlights the profound impact of cultural values on individuals' attitudes, behaviors, and decision-making processes. In doing so, it prompts researchers to acknowledge the pivotal role that cultural values play in an organization's development and its journey toward embracing a data-centric culture. Consequently, it underscores the imperative to investigate how distinct cultural values influence organizational data culture. Moreover, this theory provides a launching pad for cross-cultural analysis. By asserting the existence of universal values with differing priorities across cultures, it encourages researchers to embark on cross-cultural examinations. This avenue of exploration beckons researchers to unravel the intricacies of how data culture varies across diverse cultural landscapes and to ascertain how organizations can align their data practices with the prevailing cultural values in specific contexts.

Schwartz's theory goes beyond mere identification; it prioritizes values. The circular model of values elucidated by this theory equips researchers with the tools to discern which values take precedence within data culture. This prioritization beckons pertinent questions about the values that organizations prioritize concerning data management, decision-making, and innovation. For instance, do some organizations prioritize data security over data-driven innovation due to entrenched cultural values? Moreover, this theory sheds light on the notions of conflict and compatibility. Identifying conflicting and compatible values within the circular structure of this theory raises the need to investigate how these conflicts and compatibilities manifest within the sphere of data culture. Researchers are thus prompted to delve into ethical dilemmas, decision-making trade-offs, and organizational tensions stemming from divergent cultural values related to data, leading to a call for the exploration of cultural clustering within industries or geographic regions and an understanding of how these clusters shape data culture strategies.

Furthermore, this theory extends its influence to the individual level. Its applicability to individual-level behavior encourages researchers to probe how employees with diverse cultural values approach data literacy, data-driven decision-making, and data ethics. This development underscores the significance of researching how cultural values impact individual data-related behaviors and practices. Moreover, Schwartz's Cultural Values Theory promotes interdisciplinary collaboration. It serves as a bridge that encourages collaboration between psychology, sociology, and data science scholars. Such interdisciplinary collaboration promises a more comprehensive understanding of how cultural values intersect with data culture, necessitating research initiatives to foster and facilitate such interdisciplinary partnerships. Lastly, the theory underscores the importance of mixed-methods research. Its emphasis on values as drivers of behavior highlight the need for a mixed-methods approach, combining quantitative analysis with qualitative methods. This approach empowers researchers to delve deeply into the intricate complexities of how cultural influences shape data culture.

Schwartz's Cultural Values Theory is a foundational framework that informs and shapes the research needs identified in this discourse. It emphasizes the imperative of considering cultural values in the study of data culture, promoting cross-cultural awareness, and exploring the intricate interplay between culture and data-related practices. This theoretical foundation enriches the research landscape, providing a profound understanding of how cultural values contribute to the formation and evolution of data culture within organizations.

In today's data-driven world, fostering a robust data culture within organizations is paramount for innovation, efficiency, and informed decision-making. As explored through various studies and research, data culture encompasses a range of dimensions, including data literacy, data-driven decision-making, data collection, quality, sharing, leadership support, governance, performance measurement, continuous learning, transparency, and ethics. This cultural transformation empowers organizations to harness the strategic potential of data, leading to better outcomes and a competitive edge.

The academic research examined in this paper has shed light on the multifaceted aspects of data culture and its impact across different domains. Chatterjee et al. (2021) underscored the influence of data-driven culture on product and process innovation,

emphasizing the pivotal role of leadership support. Liu, Fang, Feng, and Gao (2022) revealed the potential of big data analytics capability in improving green supply chain integration, highlighting the moderating effect of a data-driven decision culture. McCord et al. (2021) emphasized the need for a cultural shift to prioritize data quality in ecological research. Su et al. (2021) proposed innovative methods to measure secondhand smoke exposure among expectant mothers in China, addressing unique cultural challenges.

However, while these studies have contributed significantly to understanding data culture and its implications, there remains a notable gap in the exploration of bibliometric data culture and its influence on scholarly communication within academic and research communities. This study investigates how integrating bibliometric data culture influences scholarly behaviors and practices, publishing trends, citation practices, and the visibility and accessibility of scientific knowledge To bridge this gap.
As demonstrated in the methodology section, the study will employ bibliometric data analysis techniques to examine the growth and trends in data culture publications. It will delve into the affiliations of data culture authors to gauge the visibility of this scientific knowledge. By answering the research questions, the study aims to contribute to the evolving discourse on data culture and its relevance in the scholarly communication landscape.

In conclusion, data culture continues to evolve as organizations recognize the transformative potential of data. The academic research highlighted in this paper showcases its profound impact across diverse fields, from business and supply chain management to ecological studies and public health. Nevertheless, there is still much to explore, particularly in the context of bibliometric data culture. By delving into this uncharted territory, researchers can further enrich our understanding of how data culture influences scholarly communication and knowledge dissemination, ultimately advancing the practice of data-driven decision-making in academia, organizations, and institutions.

Managerial Contribution to Data Culture
This study highlights the importance of cultural values in data managers scholarly communication. Researchers can benefit from recognizing that cultural nuances play a role in the dissemination and reception of their work. They can adapt their communication strategies to better connect with diverse audiences, especially in an increasingly globalized academic landscape. They can help data managers to understand the influence of cultural values on scholarly communication, which can encourage international collaboration. Academics from different cultural backgrounds can use this knowledge to bridge communication gaps, effectively collaborate, and ensure that their research reaches a broad audience.

It also considers cultural factors in the publication trends of the data managers. Academics can use this knowledge to strategically plan their publications by considering cultural variations in citation practices and trends. The results of this study can help researchers to increase the visibility and impact of their work. On the other hand, this study suggests how organizations and institutional data managers learn from the concept of "data culture" and its evolving nature. They recognize that fostering a data culture is not a one-time effort but an ongoing process. Organizations should invest in continuous data literacy training, promote data-driven decision-making, and create an environment that values data as a strategic asset. This research emphasizes the significance of cultural values for multinational organizations and institutional managers on how to work with diverse teams. This study suggests that organizations should promote cross-cultural collaboration and sensitivity, especially in data-related projects. This collaboration can lead to more effective teamwork and better utilization of data resources.

This study underscores the importance of data-driven decision making for data managers. Organizations should encourage a culture in which data informs decisions at all levels. This development can result in more informed and effective decision-making processes, ultimately benefiting the organization's performance and competitiveness, and suggests that organizations recognize that cultural values can influence how data are perceived and used within the organization. Tailoring data-related practices and policies to align with prevailing cultural values can lead to greater acceptance and success in implementing data-driven initiatives. This study may help managers in institutions engaged in research and education understand the impact of cultural values on scholarly communication. They can take steps to ensure that research findings are disseminated effectively, considering the cultural factors that influence citation practices and trends.

Research on bibliometric data culture offers practical insights that extend beyond academic and real-life applications. This study highlights the importance of cultural awareness in scholarly and organizational data practices. By acknowledging and adapting to cultural values, academics and organizations can enhance their effectiveness, collaboration, and impact on the data-driven world, ultimately advancing the practice of data-driven decision-making.

Limitations and Future Study
While the methodology used in bibliometric analysis is rigorous, it is limited to analyzing published academic papers. This study may exclude valuable insights from gray literature, industry reports, and non-academic sources, which could provide a more comprehensive view of data culture in practice. Combining quantitative bibliometric analysis with qualitative research methods, such as interviews and surveys, can provide a deeper understanding of the human and organizational aspects of data culture. This mixed-methods approach would offer insights into the motivations, challenges, and success factors in cultivating data culture.

ACKNOWLEDGMENT

This work was supported by the Foundation for Economic Education (Liikesivistysrahasto), Finland [grant numbers: 16–9388, 18–10407] and Jamk University of Applied Sciences, Business School, Jyväskylä, Finland.

REFERENCES

Alsaad, A. (2018). The individualistic view of culture and the nascent entrepreneurship: An examination of Schwartz's cultural values. *Journal of Developmental Entrepreneurship, 23*(4), 1850026. https://doi.org/10.1142/S1084946718500266

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

Bagchi, K., & Kirs, P. (2009). The impact of Schwartz's cultural value types on ICT use: A multi-national individual-level analysis. In *Proceedings of the International Conference on Information Systems*, 205. ICIS, Phoenix, Arizona, USA, December 15–18.

Chatterjee, S., Chaudhuri, R., & Vrontis, D. (2021). Does data-driven culture impact innovation and performance of a firm? An empirical examination. *Annals of Operations Research, 1-26*. https://doi.org/10.1007/s10479-021-04277-z

Koleśnik, K. (2013). The role of culture in accounting in the light of Hofstede's, Gray's and Schwartz's cultural dimensions theories: A literature review. *E-Finanse: Financial Internet Quarterly, 9*(3), 33–41.

Liu, Y., Fang, W., Feng, T., & Gao, N. (2022). Bolstering green supply chain integration via big data analytics capability: The moderating role of data-driven decision culture. *Industrial Management & Data Systems, 122*(11), 2558–2582. https://doi.org/10.1108/IMDS-02-2021-0124

McCord, S. E., Webb, N. P., Van Zee, J. W., Burnett, S. H., Christensen, E. M., Courtright, E. M., & Tweedie, C. (2021). Provoking a cultural shift in data quality. *BioScience, 71*(6), 647–657. https://doi.org/10.1093/biosci/biab031

Olaleye, S. A. (2020). Visualizing cultural emotional intelligence literature: A bibliometric review 2001–2020. *Intercultural Competence at Work*, 19 November 2020, Seinäjoki, Finland.

Olaleye, S. A., & Adusei, A. G. (2022a). Data economy through productization: A conceptual paper. In *From Globalization to Regionalization in a Time of Economic, Socio-Political, Competitive, and Technological Uncertainties: Current Issues and Future Expectations. Twenty Ninth World Business Congress*, June 12–16, 2022, JAMK University of Applied Sciences Jyväskylä, Finland. International Management Development Association.

Olaleye, S. A., Mogaji, E., Agbo, F. J., Ukpabi, D., & Adusei, A. G. (2022b). The composition of data economy: A bibliometric approach and TCCM framework of conceptual, intellectual and social structure. *Information Discovery and Delivery, 51*(2), 223–240. https://doi.org/10.1108/IDD-03-2021-0043

Olaleye, S. A. (2023). Bibliometric Viewpoints of Wired Campus Through Higher Institution Blogging. In *Transformation of Higher Education Through Institutional Online Spaces* (pp. 160–178). IGI Global.

Sagiv, L., & Schwartz, S. H. (2022). Personal values across cultures. *Annual Review of Psychology, 73*, 517–546. https://doi.org/10.1146/annurev-psych-010420-084053

Schwartz, S. H. (1999). A theory of cultural values and some implications for work. *Applied Psychology, 48*(1), 23–47.

Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture, 2*(1). https://doi.org/10.9707/2307-0919.1116

Su, Z., McDonnell, D., Abbas, J., Shi, L., Cai, Y., & Yang, L. (2021). Secondhand smoke exposure of expectant mothers in China: Factoring in the role of culture in data collection. *JMIR Cancer, 7*(4), e24984. https://doi.org/10.2196/24984

Tekeş, B., Üzümcüoğlu, Y., Hoe, C., & Özkan, T. (2019). The relationship between Hofstede's cultural dimensions, Schwartz's cultural values, and obesity. *Psychological Reports, 122*(3), 968–987.

Van Eck, N. J., & Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics, 111*, 1053–1070. https://doi.org/10.1007/s11192-017-2300-7

Vauclair, C. M., Hanke, K., Fischer, R., & Fontaine, J. (2011). The structure of human values at the culture level: A meta-analytical replication of Schwartz's value orientations using the Rokeach Value Survey. *Journal of Cross-Cultural Psychology, 42*(2), 186–205. https://doi.org/10.1177/0022022110393906