

The Impact of Leadership Styles 4.0 on Innovative Work Behaviour: Bibliometric Analysis



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ABSTRACT

Objective: This paper aims to identify research trends on the influence of leadership style in the era of industrial revolution 4.0 on innovation work behaviour globally.

Design/Methodology/Approach: The method used in this study is qualitative research with bibliometric analysis. The author used the Scopus database to collect empirical evidence with the keywords "innovative work behaviour" and "leadership". The data found were 189 documents obtained and analysed from 2019-2023. This dataset was converted to RIS format and imported for bibliometric analysis using VOSviewer. The analysis included publication distribution year, country, keywords and authors.

Findings: The findings of this study are the need for elaboration on the influence of leadership styles in the era of the industrial revolution 4.0 on innovative work behaviour. Future research topics on leadership styles that provide great opportunities for further study in the era of the industrial revolution 4.0 are authentic leadership, digital leadership, self-leadership, and leader-member exchange.

Research limitations/implications: This study only uses data from the Scopus database.

Originality/Value: This paper reveals research trends on leadership style and innovation work behaviour over the past 5 years (2019-2023). The results may help researchers or scholars to understand further research opportunities with the topic. This article may also provide an alternative approach to conducting literature reviews with computer-aided analysis programmes.

KEYWORDS: Innovation Work Behaviour, Leadership, Bibliometric Analysis, VOSviewer

1. INTRODUCTION

In recent years, many researchers have studied innovative work behaviour (Jan et al., 2022). Innovative work behaviour in employees plays an important role in a company (Frislia & Handoyo, 2020). Employees who have innovative work behaviour will have ideas, new ideas and skills that are adaptive to change, and can make updates according to the needs of the organisation in facing the times (Sembiring, 2023).

Entering the industrial revolution 4.0, which is marked by unlimited technological developments with various challenges, requires higher quality human resources in every organisation to be able to adapt to rapid technological changes, one of which is through innovation (Murdiastuti et al., 2021). Innovation can be realised in organisations if existing resources are involved in innovative work behaviour (Etikariena, A. (2020). The years 2020-2030 are a period where there are fundamental changes in the way humans work and live, entering this decade humans must be able to adapt to extraordinary technological advances (Hutagalung et al., 2020).

Competition for innovation is increasing rapidly, due to increasing technological change (Bevz & Kramarenko, 2020). Innovative work behaviour in employees is considered an effective predictor in encouraging organisations to adapt to the current uncertain environment (Pratiwi & Parahyanti, 2022). One of the factors that play an important role in innovative work behaviour in employees is leadership style (Purwanto et al., 2021). The role of leadership is a crucial aspect to motivate and increase innovative work behaviour in employees (Cai et al., 2019). Employees will never be separated from leadership and still need leaders who are ready to help their subordinates in achieving goals (Iqbal et al., 2023).

Recently, researchers have begun to examine various types of leadership styles to determine their influence on innovative work behaviour in employees (Khattak et al., 2023). Among them are authentic leadership (Grosyelj et al., 2021), inclusive leadership (Shakil et al., 2021), servant leadership (Zeng & Xu, 2020), ambidextrous leadership (Kousina & Voudouris, 2022) and chameleon leadership (Durrak & Kahwaji, 2022).

The results of research conducted by Gelaidan et al. (2023), explain that servant leadership has a significant positive impact on employee innovative work behaviour. Research conducted by Aslan (2019), shows that inclusive leadership has a positive

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relationship with innovative work behaviour. Research conducted by Kousina & Voudouris, (2022) found that ambidextrous leadership affects innovative work behaviour in employees.

However, there are several studies on leadership styles that have no effect on innovative work behaviour. For example, research conducted by Durrah & Kahwaji, (2022) states that chameleon leadership has no effect on innovative work behaviour. The results of research conducted by Manuati et al. (2023) show that authentic leadership has no effect on innovative work behaviour in employees.

Based on the description above, the right type of leadership style will benefit the organisation, because it has a positive impact, namely increasing and encouraging innovative work behavior in employees. On the basis of research gaps, differences in variables, and support from previous research results, the purpose of this study is to analyse the effect of leadership styles 4.0 on innovative work behavior. In addition, to map global scientific publications on leadership styles and innovative work behaviour and to determine relevant topics for further research.

Another difference between this research and previous research is in bibliometric analysis with VOSviewer software. VOSviewer software is one of the research analysis techniques used to assess the performance of a researcher, group of institutional researchers, country, or journal. This analysis is very important to consider because it provides insights that go far beyond the scope of the journal.

2. LITERATURE REVIEW

2.1. Innovative work behaviour

Innovative work behaviour is defined by Scott, et al. (1994) as the effort made by a person in carrying out a new idea at work, so that profitable goals can be achieved. Innovative work behaviour is an important idea in organisational behaviour that describes that employees have a tendency to take part in original and creative tasks that improve workflow, generate new ideas and promote company innovation (Adekanmbi & Ukpere, 2023).

Innovative behaviour is a behaviour possessed by individuals who have the aim of generating, introducing and implementing new things or creative ideas and the courage to take risks that can benefit the organisation (De Jong & Den Hartog, 2010). Therefore, innovative behaviour is important for individuals in an organisation. The innovative behaviour referred to in this study is the behaviour of individuals who have the aim of producing new ideas, processes or ways of working, and solutions that can be used to improve the efficiency and effectiveness of the organisation.

Innovative work behaviour can also be interpreted as a form of employee behaviour that leads to creating, introducing and implementing things that can include ideas, a process and new products that will be selected so that they can be relevant (Sembiring, 2023). Innovative work behaviour in employees can help companies to compete in market competition that is experiencing dynamic changes today, through the effectiveness generated by innovative work behaviour (Etikariena, 2020).

Innovative work behaviour will have a relationship with how an employee can find ways to get new ideas that will be applied to the organisation, so that it has benefits for his work (De Spiegelaere et al., 2014). Organisations must remain competitive and adjust quickly and adapt to changing circumstances (Anderson et al., 2014).

2.2 Leadership Styles in Era 4.0

Nawawi (2003) defines leadership style as the behaviour or method chosen and used by leaders in influencing the thoughts, feelings, attitudes and behaviour of organisational members. A good leadership style is one that is high in task orientation and high in human relations orientation (Alwi, 2008). According to Datf (2014) leadership is defined as the ability to influence people towards achieving organisational goals. Leadership has conceptually evolved over time as research has been conducted in various contexts and theoretical bases. Leadership style is a leader's behavioural approach in the leadership process based on certain situations (Chindana, 2018).

The industrial revolution 4.0 is a movement based on emerging digital technologies and implemented into the way organisations work (Brixner et al., 2020). This change not only focuses on its relationship with technology, but also impacts human-related aspects (Erol et al., 2016). As a result of these changes, the question of what values, traits and attributes leaders should possess or promote in the workplace in the era of the industrial revolution 4.0 has become relevant (Cresnar & Nedelko, 2020). Leaders will drive and create an organisation's future vision, mission and position in a digitalised global economy (Carton et al., 2014).

Krause (2004), developed a leadership model to explain how leadership influences cognitive processes to understand that the work environment needs to be changed and developed through innovative work behaviour to generate and implement new ideas. In facing challenges and situations in the industrial revolution 4.0 era, leadership techniques are needed to be able to innovate and think creatively. There are several kinds of leadership styles including:

- 1) Authentic leadership (Grosyelj et al., 2021),
- 2) Inclusive leadership (Shakil et al., 2021),
- 3) Servant leadership (Zeng & Xu, 2020),
- 4) Ambidextrous leadership (Kousina & Voudouris, 2022), 5) Chameleon leadership (Durrah & Kahwaji, 2022).

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1) Authentic leadership

Sanda, et al (2017) state that authentic leadership focuses on results-orientated work, but not on gaining power and personal material desires, thus having an impact on the development of creativity. Farrukh, et al (2019) explained that authentic leadership is considered a leadership style that is orientated towards long-term results, willing to guide patiently, and hardworking. Authentic leadership has been shown to increase the creativity of nurses in hospitals and high-tech manufacturing companies, encouraging work engagement and innovative behaviour (Lv et al., 2022; Bai et al., 2022). Gupta et al (2017) describe authentic leadership as individuals who actualise themselves by using self-awareness so that it can contribute to increasing innovative behaviour. That way, authentic leadership has a significant impact on increasing employee innovative behaviour (Purwanto et al., 2021; Xu et al., 2017).

2) Inclusive leadership

The inclusive leadership style is also considered the most effective approach to managing diverse work values by providing opportunities for employees in the decision-making process (Shakil et al., 2021). Employees who have consideration and input in decision making tend to apply innovative thinking (Mahmood et al., 2019).

3) Servant leadership

Eva, et al. (2019) define servant leadership as people-oriented leadership, where leaders prioritise caring for others within an organisation. Altruism in servant leadership has been shown to be effective in encouraging individual creativity and innovative work behaviour (Lee et al., 2020).

4) Ambidextrous leadership

Ambidextrous leadership theory suggests that flexible switching between opening and closing leader behaviours depends on the situation at the time of facilitating employee exploration and exploitation (Kousina & Voudouris, 2022). The main proposition of ambidextrous leadership is to foster innovative behaviour in employees. Leaders need to demonstrate both opening and closing behaviours, closing behaviours are more likely to enable the process by which employees turn creative ideas into innovative products or services (Zacher et al., 2014). While opening behaviours are behaviours that encourage ideas and experimentation (Miron et al., 2011).

5) Chameleon leadership

Bahrami & Evans (2014) define chameleon leadership as a strategy used by organisational leaders to adapt flexibly to existing needs. Chameleon leadership is a camouflage behaviour with a set of traits and characteristics that allow individuals to blend in with their environment to ensure their survival (Williams et al., 2011). Chameleon leadership is characterised by the ability of individuals to change their behaviour and adapt to different environments to achieve their desired goals (Ruiz Palomino & Banon-Gomis, 2017). Chameleon leadership is sufficient to deal with challenges and situations that require different leadership techniques (Alvesson & Einola, 2019).

3. METHODOLOGY

This research is a type of qualitative research that uses a bibliometric technique approach. Bibliometric analysis is an approach to highlighting critical insights generated from scientific literature supplied annually by researchers from various countries around the world (Martinho, 2021). Bibliometric analysis can visually map research trends, discover new patterns, and track the evolution of individual themes (Sanga & Aziakpono, 2023).

This research focuses on a literature review conducted on the Scopus database, which is one of the most extensive journal databases in the world that can provide scientific and academic information (Kulsum et al., 2022). International journals were extracted from the Scopus database using a search engine. The data source in this study consists of articles published between 2019 and 2023 (the last five years) in journals published in the scopus database.

Articles retrieved from Scopus in this study came from 189 journals downloaded with the keywords (TITLE-ABS-KEY ("leadership")) AND TITLE-ABS-KEY (("innovative" AND "work" AND "behaviour")) AND PUBYEAR > 2018 AND PUBYEAR < 2024 AND (LIMIT-TO (SUBJAREA, "BUSI")) AND (LIMIT-TO (DOCTYPE, "ar")). Articles from Scopus were analysed using the features in Scopus and saved the article file into RIS form which was then analysed using VOSviewer. VOSviewer is used to visualise and analyse trends in the form of maps based on cocitation networks or create occurrence networks from keywords (Nurmandi et al., 2021). Figure 1 shows the steps taken to collect and analyse the data collected from the Scopus database.

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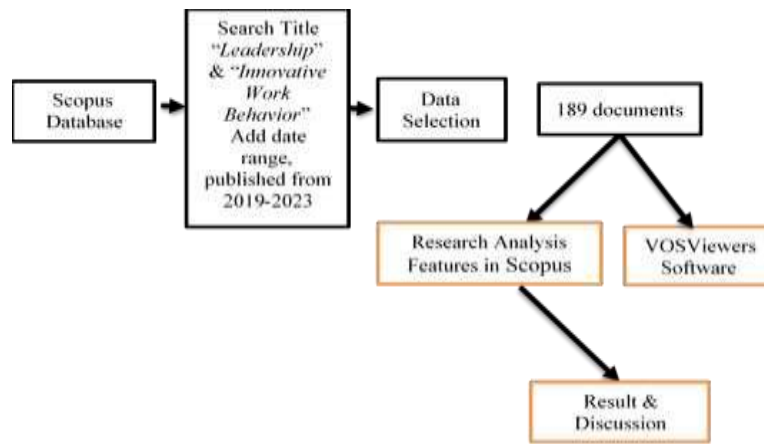


Figure 1. PRISMA flowchart used to identify, filter, and input journals for bibliometric techniques (Figure Source: Processed by the author 2024).

4. RESULTS AND DISCUSSION General Information and Annual Publication Output

4.1. Publication by Year

Figure 2 displays the number of annual publications with a first batch of 189 documents from 2019 to 2023. The number of publications continues to increase from year to year and there is a significant increase in 2023. This shows that the theme of leadership style is increasingly relevant to innovative work behaviour. The following is a visualisation of the development of research on leadership styles and innovative work behaviour over the past five years.

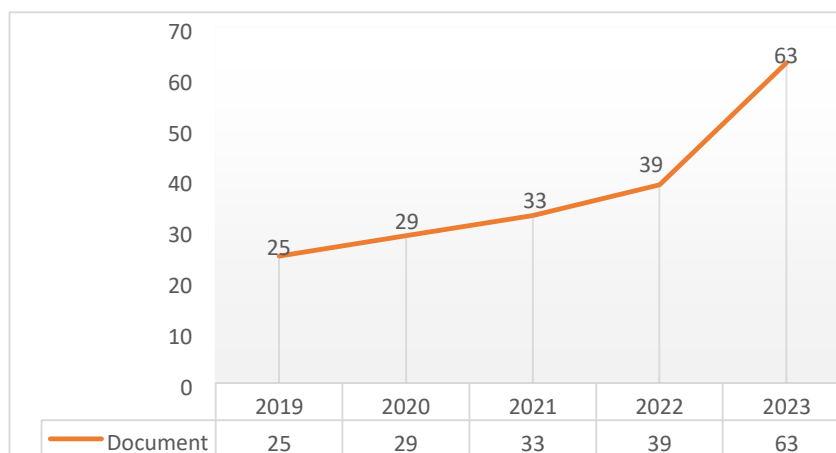


Figure 2. Global trends in publications on leadership styles and innovative work behaviour from 2019-2023.

Based on the figure above, we can see the trend of research publications on the theme of leadership styles and innovative work behaviour. Over the last five years, there has been an increase in research studies on leadership styles and innovative work behaviour, with 63 documents produced in 2023.

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4.2. Publication by Country

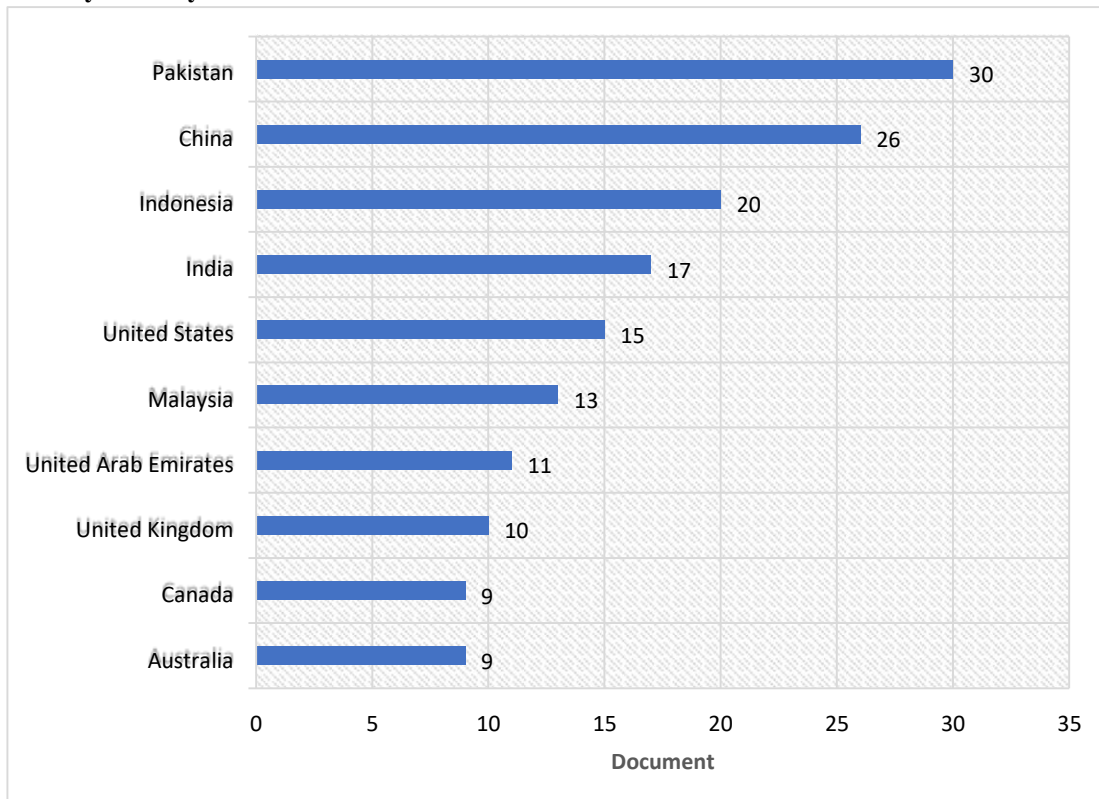


Figure 3. Shows the top 10 countries that contribute the most to leadership styles and innovative work behaviour research publications.

Based on the data above, it shows that there are 10 top countries that contribute to the publication of leadership styles and innovative work behaviour research. Pakistan became the country that contributed the most research with the theme of leadership styles and innovative work behaviour in 2019-2023, namely 30 documents. Then followed by China as many as 26 documents, Indonesia 20 documents, India 17 documents, the United States 15 documents, Malaysia 13 documents, the United Arab Emirates 11 documents. The United Kingdom also contributed as many as 10 documents, then finally Canada and Australia each as many as 9 documents. This shows that research related to leadership style and innovative work behaviour has become a topic of study in various countries in the era of the industrial revolution 4.0.

4.3. Publication by Author

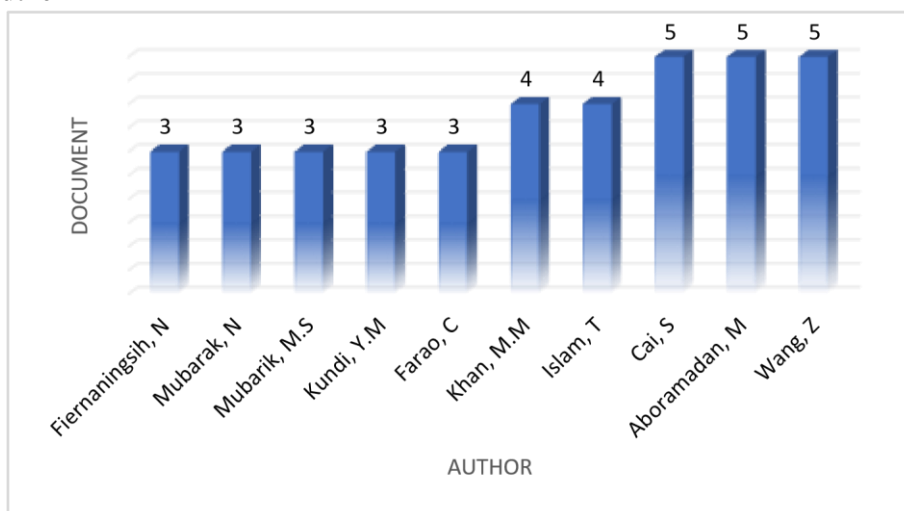


Figure 4. Shows the author's contribution and the number of publications published in research in the field of leadership styles and innovative work behaviour.

Scientific research on the influence of leadership styles on innovative work behaviour indexed by Scopus in 2019-2023 shows that the authors Wang, Z., Aboramadan, M., and Cai, S., contributed 5 research documents related to leadership, namely

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paradoxical leadership, green inclusive leadership, inclusive leadership, exploitative leadership and servant leadership. In addition, the authors Khan, M.M., and Islam, T., also contributed 4 documents in the same period. Khan, M.M., and Islam, T., extensively studied how servant leadership triggers and influences innovative work behaviour.

Farao, C., Kundi, Y.M., Mubarik, M.S., Mubarak, N., Fiernaningsih, N., each contributed 3 research documents related to leadership, namely servant leadership, transglobal leadership and inclusive leadership models in Higher Education institutions.

This data explains that several researchers have conducted research and contributed a lot in developing insights and understanding of various kinds of leadership styles and innovative work behaviours during the observed period, which is the period entering into the industrial revolution 4.0 era.

4.4. Linkage and Clustering of Themes in Leadership Styles 4.0 on Innovative work behaviours

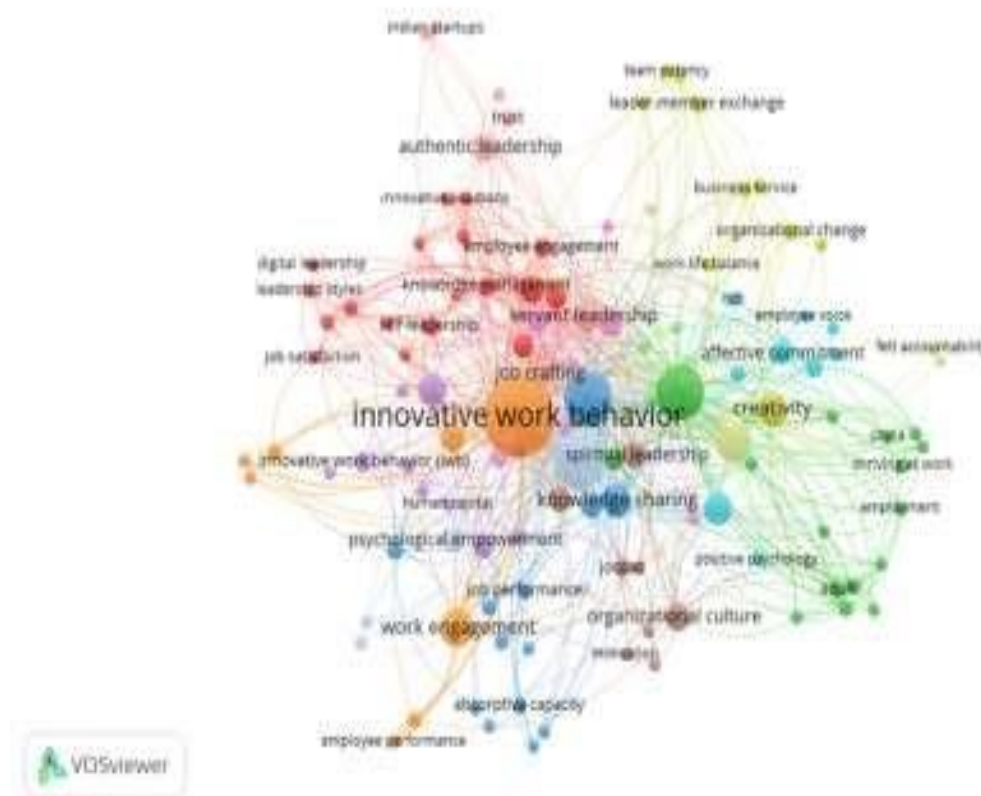


Figure 5. Shows a keyword based on network of Scopus indexed about Innovative Work Behavior research from 2019 to 2023.

Based on the data above, documents from Scopus that have been downloaded in RIS form are analysed using VOSviewer and the resulting clusters or research networks are marked with colours. Each cluster has a different colour. From the results of the analysis using VOSviewer, 7 clusters are produced which are marked with different colours, which aims to make it easier to identify the keyword network. Colours indicate clusters, while image labels indicate keywords or terms that appear frequently. Clustering is used to gain insight into bibliometric clustering, while image mapping is used to get an overall picture of the bibliometric network.

Cluster 1 (orange) with keywords: innovative work behaviour, work engagement, and employee performance. In this study, the keyword innovative work behaviour was used, thus showing the largest network or cluster. Cluster 2 (red) with keywords: job crafting, servant leadership, self-leadership, job satisfaction, leadership styles, digital leadership, knowledge management, employee engagement, innovative solutions. This shows that cluster 2 is connected to cluster 1 where leadership styles are related to innovative work behaviour.

Cluster 3 (pink) shows the keywords: authentic leadership and trust. Cluster 4 (blue) shows: knowledge sharing, job performance, Absorptive capacity, employee voice, and affective commitment. Cluster 5 (purple) with keywords: spiritual leadership, Organizational culture, and motivation. Cluster 6 (green) with the keywords employment and thriving at work. Finally, Cluster 7 (Light green) is creativity, work-life balance, organizational change, business service, leader-member exchange, and team potency. The different colours show that each cluster is interrelated to the theme of innovative work behaviours.

4.5. Linkage and Clustering in a Potrait of The Development of Leadership Styles 4.0 Studies on Innovative work behaviours

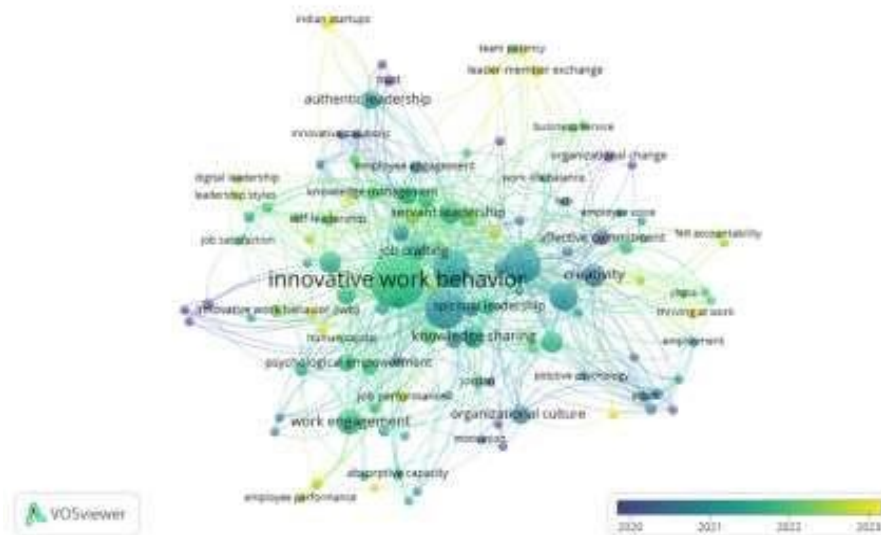


Figure 6. Potrait of the Development of Leadership Styles 4.0 Studies on Innovative work behaviours

Based on the data above, we can see the development of research on leadership styles on innovation work behaviour. The development of research can be seen from the colour and year. For example, in 2020 research on innovation work behaviour can be seen from creativity, affective commitment, motivation, organizational culture and organizational change. Then in 2021 and 2022 it can be seen in terms of leadership styles such as spiritual leadership, authentic leadership, servant leadership, digital leadership and self-leadership. In addition, there is also research on job crafting, knowledge sharing, work engagement and work life balance. Finally, in 2023 research about leader-member exchange, team potency, leadership styles, knowledge management, job performance, human capital and thriving at work. This shows that research related to innovation work behaviour continues to grow from year to year.

4.6 Linkage and Clustering Future Research Leadership Styles 4.0 on Innovative work behaviours

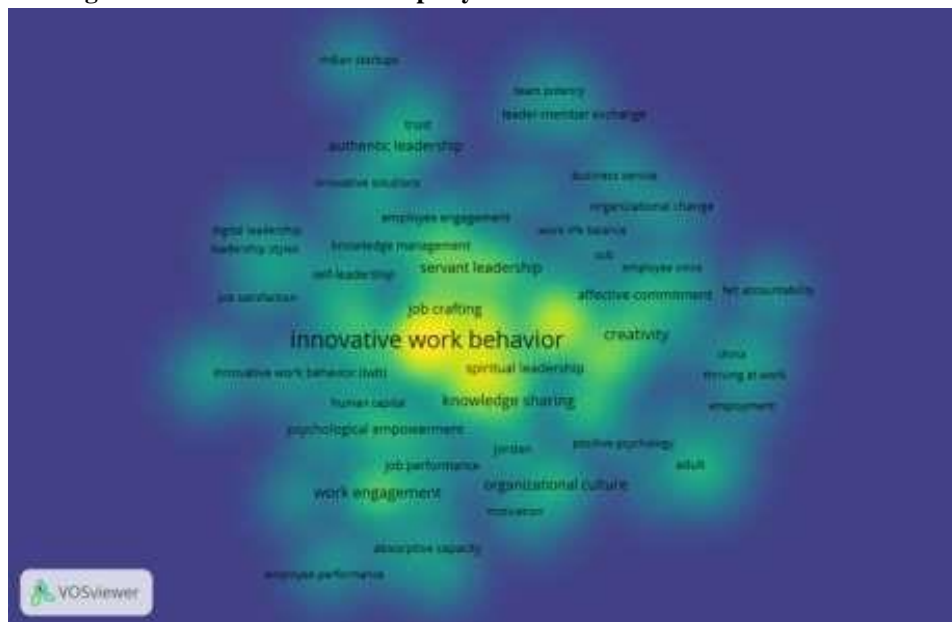


Figure 7. Research Agenda and Future Research in Leadership Styles 4.0 on Innovative work behaviours

Figure 7 is the result of data visualisation using VOSviewer by utilising visualisation tools to measure density. Density analysis is used to measure research themes that are frequently discussed but still have room for further discussion. The idea of using density analysis in VOSviewer is shown by the topics marked in yellow which indicates that the topic has been widely analysed and received widespread attention in the scientific literature. Meanwhile, the green-coloured topics indicate that they have not received much attention, so they can be findings for further research.

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Based on the figure, innovation work behaviour, job crafting, spiritual leadership, servant leadership have yellow indicators, indicating that these topics have been significantly studied by researchers. However, the topics of leadership styles, authentic leadership, digital leadership, self-leadership, leader-member exchange, innovative solutions, organizational change, thriving at work, and work-life balance are marked with green indicators, indicating that these topics have not been widely explored in relation to innovation work behaviour. Therefore, this topic can be an opportunity for researchers to delve deeper into future research.

DISCUSSION

Innovation is a critical factor for organisational success in today's competitive and dynamic environment (Skerlavaj et al., 2019). Organisations need employees and leaders to manage the organisation in order to sustain the organisation. Innovative behaviour in employees can help organisations to compete in dynamically changing market competition, through the effectiveness of innovative work behaviour (Etikariena, 2020). Meanwhile, leadership is recognised by researchers as one of the important factors that influence innovative work behaviour (Groselj et al., 2020). Therefore, research on leadership and innovative work behaviour, in the last five years, has become increasingly important and has received the attention of researchers. It is evident that there is a significant increase in publication results in 2023, many researchers are studying the topic.

This study is needed to provide knowledge about the research development trends, including the increase in the number of publications that occur each year, the contributions made by several countries and the role of authors related to the topic of leadership and innovative work behaviour. In addition, mapping and identifying topics that have the potential for further research is also a reason why this study is important.

The results of data analysis from 189 Scopus indexed articles on leadership and innovative work behaviour in 2019-2023, found countries that have a large contribution in the publication. Regarding articles on the topic of leadership and innovative work behaviour, Pakistan and China are the countries that contribute the most. This is reinforced by the results of research, namely in Pakistan by Khan et al. (2023) which explains that servant leadership is related to innovative work behaviour. The study conducted by Jawad et al. (2023) shows the direct and indirect impact of employee engagement influenced by leader support on innovative work behaviour. Research conducted by Usmanova et al. (2023), shows that spiritual leadership has a significant effect on increasing innovative work behaviour in foreign employees and local employees working in multinational companies in China. This research provides empirical evidence of the importance of leadership style in improving innovative work behaviour within an organisation.

In addition, the data shows that Wang, Z., Aboramadan, M., and Cai, S., are the authors who contributed the most in publications on the topic of leadership style and innovative work behaviour. Aboramadan et al. (2022) examined inclusive leadership in Higher Education Institutions, the results of their research showed that inclusive leadership has a positive influence on innovative work behaviour. Wang & Cai (2023) conducted research on exploitative leadership styles that have a negative impact on innovative work behaviour. The empirical findings suggest that organisations should make efforts to prevent exploitative leadership.

On the results of VOSviewer Analysis, this study displays visualisations based on keywords or networks. This analysis has been shown to be used for the advancement of science and research programs by displaying network visualisations to identify popular themes and research directions (Gao et al., 2017). This study produced 7 clusters with different colours, where each colour indicates a cluster, while the image labels indicate keywords or terms that appear frequently. This clustering technique is used to gain insight or a comprehensive picture of the bibliometric network (Liu et al., 2019). Therefore, this study found a correlation between various leadership styles such as servant leadership, self-leadership, digital leadership, authentic leadership, and spiritual leadership to innovative work behaviour indexed by Scopus in 2019-2023.

In the context of density visualisation using VOSviewer, we can visualise the density or how much a topic is researched in a domain or field of study. This density visualisation clarifies research focus, trends and interrelationships between topics. The larger the yellow nodes, the more research has been done on the topic. Conversely, green nodes indicate less research has been done on the topic. From the density visualisation results, it can be seen that research topics on leadership styles such as authentic leadership, digital leadership, self-leadership and leader-member exchange still have great opportunities for future research related to innovative work behaviour, because they have a strong relevance.

5. CONCLUSION

The development of research on the influence of leadership style on innovative work behaviour has increased over the past five years. From 2019 - 2023 there were 189 publications on the topic. This shows a significant development in interest in the research, especially in 2023. Pakistan, China, and Indonesia are the countries that contribute more to the topic of leadership styles and innovative work behaviour. Authors such as Wang, Z., Aboramadan, M., and Cai, S., have contributed research in reviewing and publishing scholarly articles on the topic of leadership and innovative work behaviour.

The visual overview also shows that the topics of innovative work behaviour, servant leadership, spiritual leadership, job crafting, knowledge sharing and creativity have been studied and received much attention from researchers. Meanwhile, topics such as leadership styles, authentic leadership, digital leadership, self-leadership, and leader-member exchange are still open for further

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research. The results of this study provide broad insights into the development and potential for conducting research on these topics in the future, especially in the era of the industrial revolution 4.0. Leadership styles that have a positive influence on innovative work behaviour can provide an influence for organisations to survive and adapt to the times. The conclusions of this study can help direct future researchers and increase understanding of leadership styles and innovative work behaviour.

This study has limitations in terms of data sources used because it only uses databases from Scopus, while data from other sources such as Web of Science are not used. Further research development is expected to explore additional data sources such as Web of Science to explore and compare data from two databases. In addition, software other than VOSviewer that has not been used in this study can be used for future analytical tools.

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