1 **Effects of transformational leadership and organizational climate on project performance**

2 **in industrial revolution 5.0: a review**

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24 **Effects of transformational leadership and organizational climate on project performance**

25 **in industrial revolution 5.0: a systematic literature review**

26

27 **Abstract**

28 **Purpose** – The relationships between transformational leadership (TL), organizational climate

29 (OC), and project performance have been investigated by previous studies, but no review of

30 existing studies has systematically analyzed the effects of TL and OC on project performance in

31 the industrial revolution (IR) 5.0 era. Therefore, this study aims to conduct a systematic literature

32 review on the effects of TL and OC on project performance in IR 5.0, and to identify mainstream

33 research topics, research gaps, and future research directions.

34 **Design/methodology/approach** – To do this, a total of 53 included journal articles were obtained

35 after initially retrieving 648 documents from the Scopus database by following the Preferred

36 Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. It consists of

37 four main steps, namely, identification of documents, screening, eligibility, and included articles.

38 In addition, science mapping analyses were conducted for keyword co-occurrence and document

39 analyses, which aided in identifying the mainstream research topics, research gaps, and future

40 research directions.

41 **Findings** – The results report the annual publication trends, keywords, and document analyses.

42 Furthermore, a detailed qualitative discussion highlighted four mainstream research topics

43 including (1) TL in project management; (2) the relationship between TL, OC, and innovation; (3)

44 safety climate; and (4) OC in project management. Moreover, this review study identified four

45 research gaps and future research directions aligned with the mainstream research topics. They

46 include: (1) longitudinal investigations and multinational corporation surveys in TL; (2) scope and

47 longitudinal data in innovation; (3) mono-method bias and universality of safety climate; and (4)

48 more comprehensive analyses of OC.

49 **Originality** – This review study would contribute to not only advancing the effects of TL and OC

50 on project performance in IR 5.0, but also enabling project managers to understand TL or OC

51 issues to improve project performance.

52 **Keywords:** Industrial Revolution; Organizational Climate, Science Mapping, Project Performance;

53 Systematic Review; Transformational Leadership

54 **Paper type:** Literature review

1. Introduction

1.1. Transformational leadership and project performance

Transformational leadership (TL) is a relatively contemporary leadership paradigm that has gained attention among politicians, historians, and psychologists as a leadership that transcended a simple social exchange between leaders and their subordinates (Asbari, 2020; Bass and Riggio, 2006). Leadership has been characterized as either transactional or transformational. Different from transactional leadership, in which leaders give monetary incentives for workforce efficiency or withhold incentives for incompetence, TL shows the opposite peculiarity (Jensen et al., 2019; Burns, 1978). It happens when leaders raise their team members' passion, develop commitment among members, endorse the goals and missions of the organization, and inspire their team members to prioritize the group's needs above their own (Ramsey et al., 2017; Bass, 1990). In transformational teams, individuals are devoted to their teammates, cognitively stimulating one another, motivating each other, and committed to the team's objectives (Top et al., 2020; Bass, 1999).

Previous studies have examined the validity of TL theory, finding a broad confirmation of the expected connections between TL and project performance (Buil et al., 2019; Nguyen et al., 2017; Bass et al., 2003). For instance, positive associations were found between ratings of TL and assessments of managerial performance by supervisors (Hater and Bass, 1988), suggestions for advancement (Waldman et al., 1990), innovations within research and development project teams (Keller, 1992), as well as the proportion of attainment in financial goals regarding essential business units (Howell and Avolio, 1993). While several previous studies indicated that TL has significant influence primarily within military contexts (Hardy et al., 2010; Ivey and Kline, 2010; Yammarino and Bass, 1990), subsequent research has amassed evidence indicating the importance of TL across other sectors, especially for project performance (Avolio and Yammarino, 2013).

1.2. Organizational climate and project performance

Organizational climate (OC) refers to a relatively persistent characteristic of an organization's internal atmosphere that is perceived and encountered by its members, ultimately shaping their conduct (Loh et al., 2019). It can also be defined by the organization's values and has a substantial impact on the behaviour of individuals within organizations (Mullins, 2014). The concept under consideration surfaced in scholarly literature almost a century ago (Lewin et al., 1939). However, research has often overlooked the intricate and occasionally provided unclear connection between organizational culture and climate (Wallace et al., 1999). While some scholars asserted that there is an overlap between the concepts of organizational culture and OC (van den Berg and Wilderom, 2004), it is important to acknowledge that these concepts are inherently separate from one another (Schneider et al., 2013). According to Hatch (1993), culture is commonly perceived as a compilation of core values and belief systems that provide significance to organizations. As such, it is considered as a more intuitive concept compared to OC, which encompasses more observable elements such as behavioural and attitudinal traits (Moran and Volkwein, 1992). From one

95 perspective, OC is perceived as a characteristic of the organization that individuals encounter daily,
96 regardless of their specific work location. It is not as nuanced or endearing as culture, but rather
97 akin to spirit. Additionally, it exerts a significant influence on individuals within the workplace,
98 much like the atmospheric climate impacts people's overall attitudes and behaviours (Furnham,
99 2012). Numerous researchers in the domains of organizational psychology have endeavoured to
100 elucidate the effects or outcomes of OC (Rožman and Štrukelj, 2021; Sethibe, 2018; Agarwal,
101 2015; Furnham, 2012). For instance, Sethibe (2018) contended that substantial research has
102 demonstrated an association between various climate factors and project performance.
103

1.3. Overview of industrial revolution 5.0

105 In the context of industrial revolution (IR) 5.0, which aims to optimize resource utilization to
106 enable management teams to focus on strategic tasks more effectively, and emphasizes a greater
107 significance of human intelligence than ever before (George and George, 2020). Consequently, in
108 the IR 5.0 era, managers are suggested to place human needs and interests as the central focus of
109 a project (Breque et al., 2021; Xu et al., 2021; Demir et al., 2019). It is also essential to establish a
110 secure and inclusive work environment that prioritizes physical health, mental health, and overall
111 well-being (Xu et al., 2021). Additionally, IR 5.0 strives to make the industry a sustainable source
112 of wealth by recognizing its ability to do more than just provide employment and economic
113 progress (Breque et al., 2021). IR 5.0 can be accomplished by coordinating manufacturing methods
114 with the ecological constraints of our planet and prioritizing the health and safety of industrial
115 workers throughout the production cycle (Demir et al., 2019). Thus, companies that fail to adapt
116 their leadership style or OC to align with the IR 5.0 will swiftly become obsolete, missing out on
117 the competitive advantages it can provide (George and George, 2020).
118

1.4. Research rationale and objectives

120 Previous review studies have analyzed various effects of TL and OC on project performance
121 (Alblooshi et al., 2021; Hussain and Khayat, 2021; Sethibe and Steyn, 2016). Sethibe and Steyn
122 (2016) employed a systematic review to report how organizations can enhance their individual and
123 team performance by fostering a combination of TL style and a climate conducive to innovation,
124 thus creating added value. Similarly, a systematic literature review and narrative synthesis were
125 applied to conclude that TL exhibits a strong association with employee creativity, thereby
126 generating heightened levels of employee motivation and skill enhancement (Alblooshi et al.,
127 2021). Moreover, Hussain and Khayat (2021) used a quality assessment tool to offer evidence
128 regarding the substantial impact of TL on both employees and the overall organizational
129 environment.
130

131 Despite the multitude of traditional review studies that focused on the positive effects of TL and
132 OC on the performance of corporations (Buil et al., 2019; Sethibe and Steyn, 2016), the existing
133 research still lacks the common influence of the two factors on project performance. Hence, it is
134 imperative to undertake a systematic review study to delineate directions for future research and

to serve as a valuable point of reference for project managers and other researchers. The outcomes of this review may help researchers to identify crucial research areas and offer project managers an enhanced knowledge of management skills.

Several areas of people and organization research fields such as servant leadership (Eva et al., 2019), communication style (Janssen and Lagro-Janssen, 2012), employee well-being (Mäkikangas et al., 2016; Shi and Antwi-Afari, 2023), and work motivation (Kocman and Weber, 2018) have utilized a systematic review approach. A systematic literature review, alternatively referred to as research synthesis, endeavours to conduct a comprehensive and unbiased compilation of numerous pertinent studies within a specific field (Aromataris and Pearson, 2014). It entails the process of identifying, synthesizing, and evaluating all accessible evidence, whether quantitative or qualitative, to generate a robust and empirically derived response to a specific research question (Mallett et al., 2012). As a result, it is feasible to improve conventional review studies conducted in the field of TL and OC. Despite previous review efforts, no study has employed a systematic literature review with science mapping analysis to synthesize and quantitatively analyze the existing body of knowledge on the effects of TL and OC on project performance in the IR 5.0 era. As such, this review paper is crucial to address the gap in the existing literature, and to advance theoretical and practical understanding of TL, OC, and project performance in the context of the IR 5.0 era.

Therefore, this study aims to conduct a systematic literature review from 1991 to July 2023 on the effects of TL and OC on project performance in IR 5.0, and to identify the mainstream research topics, research gaps, and future research directions. The specific research objectives of this review study include:
1. analyze the annual publication trends, co-occurrence of keywords, and document analysis related to TL and OC on project performance in IR 5.0.
2. identify and discuss the mainstream research topics in TL and OC on project performance in IR 5.0.
3. highlight the research gaps and future research directions of TL and OC on project performance in IR 5.0.

The remainder of the review paper is as follows. Section 2 discusses the literature review on the studied topic. Section 3 presents the research methods involving systematic literature review (i.e., PRISMA guidelines) and science mapping analyses (i.e., VOSviewer). The results of annual publication trends, co-occurrence analysis of keywords, and document analysis are presented in Section 4. The mainstream research topics, research gaps, and future research directions are emphasized in Section 5. Lastly, Section 6 summarizes the conclusions, contributions, limitations, and further studies.

2. Literature review

Previous studies have demonstrated that the behaviours exhibited by project managers significantly contribute to achieving higher levels of project performance (Scott-Young and Samson, 2008; Zwikael and Unger-Aviram, 2010). Transformational leaders inspire their followers to surpass expectations and cultivate positive working relationships (Sohmen, 2013). The literature reveals that TL consists of four key elements such as idealized influence, intellectual stimulation, inspirational motivation, and individualized consideration (Aga et al., 2016; Raziq et al., 2018). Project managers usually heighten the growth of self-management or self-leadership abilities in their subordinates, build team cohesiveness and mutual understanding, and facilitate the interchange of ideas and various viewpoints across project teams (Aga et al., 2016). Consequently, they create an environment where team members are motivated to exert continuous effort in attaining project success (Burke et al., 2006). Afzal et al. (2018) found a positive correlation between TL and project performance upon collecting primary data by using a structured questionnaire. Similarly, prior studies have reported the pivotal role of a project manager's leadership style in achieving project success characterized by stakeholder satisfaction, effectiveness, and efficiency (Aga et al., 2016). Overall, extant studies have demonstrated that TL and project performance are positively correlated (Kissi et al., 2013; Vincent-Höper et al., 2012; Yang et al., 2011).

OC is a critical element of the work environment that directly influences project behaviour within an organization (Rožman and Štrukelj, 2021). Various organizational characteristics and interpersonal interactions shape employees' work environments and subsequently affect their project performance (Berberoglu, 2018). Maamari and Majdalani (2017) asserted that a positive OC enhances project effectiveness and reduces costs associated with employee turnover. Additionally, a healthy OC positively impacts financial outcomes, including increase in revenue, profitability, and return on sales, thus resulting in project success (Purohit and Wadhwa, 2012). Moreover, it was reported that organizations could attain higher levels of motivation, dedication, and employee engagement by establishing a favourable OC as perceived by individuals, resulting in improved project performance (Shanker et al., 2017). These authors further revealed a significant and positive impact of OC on innovative work behaviour, highlighting the influential role of a creative culture in enhancing project performance (Shanker et al., 2017). In congruence with other studies, employees are more inclined to engage in work activities if they are granted independence and autonomy. This finding is attributed to the perception that employees have control over their work conditions and the ability to make decisions or changes (Kissi et al., 2012). Moreover, Odoardi et al. (2010) suggested that employees are more likely to embrace innovation-related goals and exhibit innovative behaviour when they perceive their workplace as valuing their creative and innovative endeavours. This is further reinforced when their ideas are genuinely acknowledged and accepted. These findings are also aligned with previous studies that were conducted in diverse cultural contexts, identifying a significant association between employees' creativity and project performance (Rahnama et al., 2011).

215 Many organizations have embraced the idea of the IR 5.0 (Xu et al., 2021). The concept of IR 5.0
216 focuses more on digitalization and artificial intelligence (AI)-driven technologies for improving
217 production efficiency and workers' health and safety (Xu et al., 2021). Consequently, IR 5.0 offers
218 a unique viewpoint that emphasizes the importance of research and innovation in empowering
219 industries to serve mankind in the long term while functioning within the constraints of the planet
220 (Nahavandi, 2019). Despite extant literature, this study focuses on the effects of TL and OC on
221 project performance in IR 5.0, and to identify the mainstream research topics, research gaps, and
222 future research directions.
223
224 **3. Research methods**
225 This review study employed a systematic literature review and science mapping analysis. The
226 systematic literature review was adopted due to its reliability and verifiability in evaluating and
227 analyzing existing literature samples in a specific domain (Harris et al., 2014). In this review study,
228 the systematic literature review followed the Preferred Reporting Items for Systematic Reviews
229 and Meta-Analyses (PRISMA) guidelines because it is justified by its evidence-based nature, well-
230 established procedures, and auditability (Moher et al., 2010). Additionally, the science mapping
231 analysis makes it possible to create bibliometric maps that show the conceptual, intellectual, and
232 social structure of certain disciplines, scientific areas, or research sectors (Cobo et al., 2011).
233 Figure 1 illustrates an outline of the research methods by adopting the systematic literature review
234 (i.e., PRISMA guidelines) and science mapping analysis (i.e., VOSviewer). Subsequent sections
235 provide a detailed description of the adopted methods.
236 <Please insert Figure 1 about here>
237 *3.1. Systematic literature review*
238 *3.1.1. Identification of documents*
239 The first step of this review study was to conduct a systematic literature search in the Scopus
240 database, as it covers a greater selection of journals and more current articles compared to other
241 digital sources (Jin et al., 2019; Chadegani et al., 2013; Antwi-Afari et al., 2023). In Scopus, four
242 main keywords such as "transformational leadership", "organizational climate", "project
243 performance" and "industrial revolution" were used as search strings within the "article
244 title/abstract/keywords" to search for literature samples or documents. In the beginning, 648
245 documents were retrieved. To ensure the reliability and validity of included articles, the full search
246 string from the Scopus database was: (TITLE-ABS-KEY (leadership OR transformational) AND
247 TITLE-ABS-KEY (organizational OR climate) AND TITLE-ABS-KEY (project OR performance)
248 AND TITLE-ABS-KEY (industrial OR revolution OR ir)) AND PUBYEAR ≥ 1991 AND
249 PUBYEAR ≤ 2023 AND (LIMIT-TO (SUBJAREA, "ENGI")) AND (LIMIT-TO (DOCTYPE,
250 "ar")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English")) AND
251 (LIMIT-TO (PUBSTAGE, "final")). Notably, the search string employed in this study is similar
252 to previous review studies (Egeonu and Jia, 2024; Zhang et al., 2024) that used the Boolean
253 operator "OR" to not only broaden the search query but also to retrieve related documents using

254 either term. The search query was conducted on 15 July 2023, as such, the studied period was
255 limited to articles from 1991 to July 2023.
256
257   *3.1.2. Screening criteria*
258 Further screening of these documents involved (1) the inclusion of only journal articles published
259 in English language, (2) the subject area was limited to "engineering", and (3) the publication stage
260 was limited to "final". Consequently, conference papers, books, etc were excluded from the
261 literature samples due to their abundant quantity and less meaningful or practical information as
262 compared to journal articles (Butler and Visser, 2006). After the screening process, a total of 101
263 articles were obtained.
264
265   *3.1.3. Eligibility*
266 Subsequently, the remaining 101 articles were further screened with a detailed examination of their
267 titles, abstracts, and full texts. Some articles such as Maalouf and Hoque (2022) and Bieńkowska
268 et al. (2022), although mentioned "organizational", "performance", and "leadership" in their
269 abstract, did not focus on the impacts of TL on project performance. The authors discussed active
270 leadership and servant leadership instead of TL and OC on project performance. Articles with a
271 similar research goal that did not focus on the effect of TL and OC issues on project performance
272 were excluded from this review study. Other articles (e.g., Houghton, 2011), although contained
273 the keyword "climate", focussed on climate change rather than OC. Articles with such research
274 goals were also excluded. Furthermore, some articles within the context of IR did not cover the
275 effects of TL or OC on project performance. For example, these articles were excluded because
276 they investigated other aspects such as digital transformation (Bauer et al., 2015), digital twin and
277 digital thread framework (Pang et al., 2021), and quantum strategic organizational design
278 (Villalba-Diez and Zheng, 2020). The detailed eligibility criteria are listed in Table 1.
279   <Please insert Table 1 about here>
280   *3.1.4. Included articles*
281 Overall, a total of 53 journal articles were included as the literature samples for science mapping
282 analysis after the screening and eligibility steps. Before conducting the science mapping analysis,
283 this study presented the annual publication trends (see Section 4.1) which demonstrate the number
284 and rationale of published articles from 1991 to July 15, 2023.
285
286 ***3.2. Science mapping analysis***
287 In the next stage of the review process, a science mapping analysis was employed to analyze the
288 selected or included articles related to the effects of TL and OC on project performance in IR 5.0.
289 A science mapping analysis is a generic process of domain analysis that uses a large body of
290 literature to graphically map the progression of scientific knowledge in a certain field (Small, 1999;
291 Antwi-Afari et al., 2023). There are several science mapping tools for analyzing and visualizing
292 the bibliometric network of scientific research, including BibExcel, CiteSpace, CoPalRed, Gephi,
293 IN-SPIRE, Science of Science tool, VOSviewer, and others (Cobo et al., 2011; Imran et al., 2018;

294 Sultan et al., 2021). Out of these tools, VOSviewer was chosen due to its freely available and user-
295 friendly features for network mapping analyses (Van Eck and Waltman, 2010; Mu and Antwi-
296 Afari, 2024). VOSviewer can also generate distance-based visualizations of networks, with node
297 proximity indicating the level of closeness among them (Van Eck and Waltman, 2014). In addition,
298 VOSviewer is well-suited for visualizing larger networks and offers specific text-mining
299 capabilities (Van Eck and Waltman, 2014). By applying VOSviewer as a science mapping tool,
300 two types of analyses and visualizations were conducted in this review study: (1) co-occurrence
301 analysis of keywords; and (2) document analysis. After conducting the science mapping analysis,
302 the final stage involved a qualitative discussion to comprehensively examine the mainstream
303 research topics on the effects of TL and OC on project performance in IR 5.0. Additionally, the
304 discussion section highlighted the research gaps/limitations of existing studies and identified future
305 research directions of TL and OC on project performance in IR 5.0.
306
4. Results
4.1. Annual publication trends
309 The initial categorization of the 53 included journal articles is done according to the year each
310 article was published. The distribution of these journal articles over different publication years is
311 shown in Figure 2, which has witnessed fluctuations and variations in the number of publications.
312 Before the year 2000, few articles were published. The earlier articles were compiled in a five-
313 year interval, thus from 2000 to 2005. Articles published from 2006 onwards were tallied on an
314 annual basis. It can be seen from Figure 2 that nine articles were published in 2008, which is a
315 considerably increased number of articles that demonstrated a spike in research effort.
316 Subsequently, in the years 2009 and 2010, no publications were recorded. From 2011 to 2017, the
317 annual publication trend of articles displayed fluctuating patterns, with zero publications in 2016,
318 two publications each in 2011 and 2012, one publication each in 2013 and 2017, and a peak of
319 three publications in 2014. Three articles were published in each of the years including 2019, 2020,
320 and 2021. In 2022, there was a slight improvement with four articles published. There are two
321 articles published in 2023 that are currently accessible. It is anticipated that there will be a
322 continuous influx of research publications in the studied domain, as it remains an enduring and
323 critical research field within the field of people and organization.
324   <Please insert Figure 2 about here>
4.2. Co-occurrence analysis of keywords
326 Keywords generally encompass the basic content of published articles and identify certain study
327 areas that are investigated within a specific domain (Van Eck and Waltman, 2010). In this review
328 study, a co-occurrence analysis of keywords was performed to create and visualize the knowledge
329 domain of the effects of TL and OC on project performance in IR 5.0. The analysis utilized "author
330 keywords" as the unit of analysis and "full counting" as the counting method in VOSviewer. With
331 a minimum occurrence threshold set to 2, only 17 out of the total 189 keywords satisfied the criteria.
332 Before selecting this threshold, several trials were conducted on different thresholds with the
333 intention of including sufficient samples of author keywords among total keywords. In addition, a

334 selected threshold of 2 has been used in previous studies that conducted keyword co-occurrence
335 analysis (Zhang et al., 2024; Chiang et al., 2023; Sun et al., 2023). Additionally, a thorough
336 examination was conducted on terms with similar contextual meanings, such as (1) "leadership
337 style" and "leadership styles" and (2) "performance management" and "performance
338 managements". This analysis aimed to either remove generic key terms or merge keywords with
339 similar meanings. After the removal of generic keywords, the co-occurrence analysis of keywords
340 resulted in 13 items, 4 clusters, 22 linkages, and 26 link strengths, as depicted in Figure 3.
341
342 As illustrated in Figure 3, author keywords such as "leadership", "innovation", "continuous
343 improvement" and "transformational leadership" are presented in larger nodes, indicating their
344 higher frequency of use in previous articles within the studied research domain. The distances and
345 connection lines in Figure 3 indicate the interconnectedness between pairs of keywords. For
346 instance, the keyword "leadership" is closely associated with "continuous improvement",
347 "innovation", and "performance". Based on the different colours represented in Figure 3, the
348 authors' keywords can be classified into four main clusters that encompass the core knowledge
349 domains of research related to the effects of TL and OC on project performance in IR 5.0.
350 <Please insert Figure 3 about here>
351 Table 2 presents the keywords and their corresponding network data. The table reveals that
352 "leadership", "safety climate", and "transformational leadership" are the most frequently utilized
353 keywords in the list, indicating their extensive research focus in the field of TL and OC on project
354 performance in IR 5.0. While the links indicate the number of connections between a specific node
355 and other nodes, the total link strength reflects the cumulative strength associated with a particular
356 item (Van Eck and Waltman, 2010). For instance, the "leadership" keyword possesses a total link
357 strength of 12, highlighting a significant interrelation between "continuous improvement" and
358 "innovation".
359
360 Notably, the authors' keywords listed in Table 2 are arranged following the ranking of their
361 occurrences. It is evident from Table 2 that keywords with the highest frequency of occurrence do
362 not necessarily have the highest average citations or average normalized citations. For example,
363 keywords with the highest average normalized citations include "performance management",
364 "transformational leadership" and "safety climate". This suggests that research focusing on the
365 satisfactory safety climate in a work environment (Wu et al., 2008), the significance of the
366 mediator role of TL (Tan et al., 2022), or the impact of TL on product and process innovation
367 (Begum et al., 2022) are likely to have a greater impact within project performance. Apart from
368 average normalized citations, the average publication year reflects the recency of keywords being
369 studied and published. The authors' keywords listed in Table 2 have been studied in diverse years.
370 For example, keywords like "continuous improvement" and "manufacturing" are more
371 traditionally researched keywords. In addition, emerging keywords in this context encompass
372 "safety performance", "safety climate", "transformational leadership" and "organizational culture".
373 <Please insert Table 2 about here>

374 Analysis of Figure 3 and the data presented in Table 2 suggests the identification of the subsequent
375 clusters of keywords, delineating the prominent trajectories of research within the realm of TL and
376 OC on project performance in IR 5.0:
377   1. *The influence of TL on project performance* is channelled through a sequence of mediated
378   relationships involving team building and teamwork (Ali et al., 2021). Project managers
379   may adapt TL to provide support to subordinates, facilitating the attainment of elevated
380   project performance and bolstered leadership outcomes (Gandasari et al., 2023; Begum et
381   al., 2022; Yuan and Vu, 2017; Limsila and Ogunlana, 2008).
382   2. *The constructive impact of TL and OC* is observed in fostering positive outcomes on
383   innovative work behaviour. This influence also extends to project performance, displaying
384   a substantial and affirmative association (Begum et al., 2022; Mirza et al., 2020; Albrecht
385   et al., 2018; Shanker et al., 2017; Sethibe and Steyn, 2016; Odoardi et al., 2010).
386   3. *Project performance aimed at achieving excellence* requires essential attributes such as a
387   satisfactory safety climate and a pleasant work environment. Effective TL stands as a
388   fundamental requirement for cultivating and maintaining these crucial components
389   (Mathisen et al., 2023; Newaz et al., 2023; Kim et al., 2019; Wu et al., 2008).
390   4. *TL can positively influence OC*, which can exhibit a positive correlation with project
391   performance, contribute to the enhancement of project performance in IR and levels of
392   engagement, and enhance the efficacy of formulating corporate strategies (Armstrong and
393   Taylor, 2023; Gandasari et al., 2023; Rožman and Štrukelj, 2021; Yusuf Saleh and Kahar,
394   2018; Ford, 2011).
395

4.3. Document analysis

397 The analysis of documents unveils the predominant research topics (see Section 5.1) explored
398 within a particular field of study and facilitates the scholarly intellectual capacity of the volume
399 and quality of references cited in other scholarly articles. This section is dedicated to the utilization
400 of VOSviewer to construct a network of document analysis within the studied research domain.
401 By setting the threshold of citations for a given document at a minimum of 25, a total of 19
402 documents, out of a pool of 53, satisfied this criterion.
403

404 Table 3 provides a concise summary of documents with high citation counts related to the studied
405 topic. It is worth noting that the 19 papers in Table 3 are arranged in order of their total citation
406 counts across the study timeframe. As seen in Table 3, the three most cited documents on the
407 effects of TL and OC on project performance in IR 5.0 are Pal et al. (2014) (261 citations), Lloréns
408 Montes et al. (2005) (209 citations), García-Morales et al. (2006) (188 citations). Among these
409 Lloréns Montes et al. (2005) focused on the effects of TL, shared vision, and organizational
410 environment on performance enhancements, finding that they could foster organizational
411 entrepreneurship and enhance competitive advantages. When it comes to the normalized citations,
412 Scott-Young and Samson (2008) and Begum et al (2022) had higher scores, 3.13 and 3.22,
413 respectively. This may indicate that the findings in these articles have gained significant attention

414 and recognition. Many prominently referenced articles detailed in Table 3 typically employed
415 survey questionnaires to assess the extent and attributes of TL and OC (Valmohammadi and
416 Roshanzamir, 2015; Zhou et al., 2018; Lloréns Montes et al., 2005).

417 <center><Please insert Table 3 about here></center>

418 **5. Discussion**

419 ***5.1. Summary of mainstream research topics related to the effects of TL and OC on project***
420 ***performance in IR 5.0***

421 *5.1.1. Transformational leadership (TL) in project management*

422 Numerous studies have been conducted on TL in project management (Gandasari et al., 2023;
423 Begum et al., 2022; Yuan and Vu, 2017; Limsila and Ogunlana, 2008), as well as linking TL to
424 project performance measurement (Ali et al., 2021; Buil et al., 2019). TL, a relatively
425 contemporary leadership (Asbari, 2020), occurs when leaders develop and boost the passions of
426 their team members, establish a grasp and endorsement of the organization's aims and purposes,
427 and encourage their team members to prioritize the needs of the group over their own (Ramsey et
428 al., 2017). Individuals under TL are devoted to their colleagues, cognitively stimulating and
429 inspiring one another, and committed to project goals (Top et al., 2020).

430

431 TL has a positive impact on project performance through several mediating factors such as team-
432 building practices, high-quality teamwork, and shared vision (Ali et al., 2021; Yang et al., 2011).
433 By enhancing workgroup quality through communication, coordination, and cohesiveness, TL
434 would contribute to project success (Ali et al., 2021). According to Aga et al. (2016), there is also
435 a strong correlation between project managers' adoption of a TL style, project performance, and
436 team-building techniques. In addition, by establishing a shared vision and a single purpose for
437 project success, TL enables project managers to serve as role models for their peers (Yang et al.,
438 2011). Apart from the mediating factors discussed above, TL is essential for inspiring and
439 motivating team members to strive toward project objectives and achieve greater project
440 performance (Raziq et al., 2018). Consequently, applying TL style can increase the likelihood of
441 completing projects on time and under budget, which ultimately helps project-based businesses
442 (Wu et al., 2017). However, project resilience and project clarity may be considered as negative
443 moderators of the relationship between TL and project performance (Zaman et al., 2019). Although
444 there is a viable relationship between TL and project performance, this relationship weakens when
445 programmes become more flexible and visible (Patanakul, 2015).

446

447 To sum up, most of the existing studies found either a positive direct relationship between TL and
448 project performance or through several mediating factors. TL style is effective in a variety of
449 project contexts; however, project managers should be aware of contextual issues that could limit
450 its effectiveness such as project flexibility and project visibility. This will enable more specialized
451 leadership techniques to maximize project outcomes.

452

5.1.2. *The relationship between transformational leadership (TL), organizational climate (OC), and innovation*

The relationship between TL, OC, and innovation occurs as a result of encouraging a TL style and an environment that supports innovation, as well as organizations that focus on improving project and individual performance (Sethibe and Steyn, 2016). A positive relationship between TL and innovation can lead to higher levels of employee enthusiasm and skill development (Alblooshi et al., 2021). Innovative work behaviour can also function as an intermediary factor in the connection between the innovation-focused OC and project performance (Shanker et al., 2017).

Innovation may have a direct or indirect relationship with TL. In terms of direct relationship with TL, organizations can push beyond their limitations to integrate their core knowledge to enhance project performance and product innovation (Pham et al., 2023; Mazzola et al., 2015). On the other hand, the indirect relationship between TL and innovation is mediated by organizational learning. Notably, organizational learning encourages firms to adopt innovative processes (Pham et al., 2023). According to Begum et al. (2022), both product and process innovations were positively impacted by creative process involvement and environmentally conscious TL. The existence of environmentally focused TL is positively correlated with its involvement in the creative process. Additionally, creative process engagement has a mediating role in the influence of environmentally focused TL on project and product innovation (Begum et al., 2022; Zhou et al., 2018). Thus, the findings offer compelling empirical evidence that creative process involvement and environmentally conscious TL have contributed to the development of project and product innovation (Begum et al., 2022). Furthermore, corporate flexibility and control culture have an impact on an organization's sustainable project performance because they foster creative skills (Wang and Huang, 2022). The moderating influence of TL style on this relationship is also worth examining. Specifically, the association between a culture of adaptability and the ability to innovate is positively moderated by TL (Wang and Huang, 2022).

In summary, encouraging TL and an environment that supports innovation can improve project and individual performance and generate added-value initiatives. Innovation and TL have a positive relationship that encourages employee engagement and skill development. The relationship between an innovation-focused organizational atmosphere and project performance is mediated by innovative work behaviour. With a direct relationship, innovation, and TL can promote knowledge integration and enhanced project performance. Organizational learning can indirectly mediate the relationship between TL and innovation. TL style that is environmentally focused and positively correlated with the creative process can mediate its influence on project and product innovation. Sustainable project performance is influenced by corporate flexibility and control culture, with TL acting as a moderator in the relationship between a flexible OC and the capacity for innovation.

5.1.3. Safety climate

Research shows that TL affects safety climate, thus, it can influence project behaviour (Lingard et al., 2019; Shen et al., 2017). It was found that TL style exhibited by supervisors had a positive and statistically significant relationship with both group health and safety climate and employees' behaviours. Safety climate is assumed to play a mediating role in the relationship between TL and project behaviour (Lingard et al., 2019). According to Clarke (2013), while TL has been linked to several safety outcomes, it is observed to have a stronger impact on optional safety performance such as extra-role performance and participation than it does on the simple observance of minimal safety regulations and standards. Furthermore, the relationship between an organization's performance and the involvement of employees in safety compliance and participation reveals that employees tend to reciprocate with excellent safety performance when they believe their employers have met their health and safety duties (Mullen et al., 2017). However, the beneficial effects of these fundamental safety procedures are noticeably magnified when managers demonstrate a high level of TL. As such, TL can increase the efficacy of policies and practices required by safety regulations. These findings highlight the substantial role of TL in promoting safety performance inside organizations (Mullen et al., 2017). According to Zohar and Polachek (2014), when transformational leaders communicate safety priorities at routine meetings, employees' perception of safety performance increases. Employees' perceptions of safety climate and performance are improved because of the perceived importance of safety being raised. In addition, the impacts of different TL elements on employees' safety performance have been examined (Hoffmeister et al., 2014). The implication of TL as a key factor in determining both safety compliance and safety engagement has been demonstrated (Hoffmeister et al., 2014). Taken together, these studies show how crucial TL is needed to improve project safety performance within organizations. In addition to influencing how employees view the issue of safety, TL acts as a catalyst for improved safety climate, involvement, and compliance.

5.1.4. Organizational climate in project management

OC refers to a generally enduring aspect of an organization's internal environment that members see and encounter, ultimately influencing their behaviour (Loh et al., 2019). The impacts or results of OC have been demonstrated by numerous studies in the field of organizational psychology (Rožman and Štrukelj, 2021; Agarwal, 2015; Furnham, 2012). The organizational structure, member relationships, employees' behaviour, performance expectation, and growth opportunities are all components of the OC (Kumar-Bamel et al., 2013). Additionally, performance at the individual, project, and organizational levels is knowingly impacted by OC (Ghanbari and Eskandari, 2016). Employees' behaviour, motivation, engagement, and outcomes, as well as job satisfaction and commitment, are all positively correlated with OC. A supportive work environment enhances project performance, productivity, and job satisfaction (Castro and Martins, 2010).

To provide a thorough analysis of OC factors and how they affect workers' job performance, Rožman and Štrukelj (2021) conducted a study on the factors of organizational environment and their impact on employees' performance at work. Their findings revealed that successful firms should recognize the value of identifying and appreciating OC components that increase project performance and engagement. Employers should foster a healthy work environment with their co-workers because companies that value employees' happiness and cohesion foster a productive and pleasurable work climate (Ford, 2011). Thus, an engaged workforce in attaining project performance is shown to have a positive correlation between OC and project success (Rožman and Štrukelj, 2021). In addition, Li and Mahadevan (2017) conducted a study between independent OC factors (e.g., role clarity, communication, career and development, incentive structure, connection, and teamwork) and a dependent variable such as project performance. Their results show that an essential element of organizational atmosphere that improves employees' performance is solid internal communication. The third most momentous effect of OC factor on employees' performance is excellent cooperation. Even though career development practices and well-designed incentive systems had the lowest coefficient, they nevertheless affect employees' performance (Li and Mahadevan, 2017). Similarly, Akbaba and Altındağ (2016) stated that workplace climate characterized by clear job roles is associated with higher levels of employee efficiency and productivity. In addition, the importance of employee-company relationships was emphasized, highlighting factors such as employees' well-being and prioritizing minority perspectives, which directly influence employees' perspectives and project performance (Bahrami et al., 2016).

In summary, OC, a lasting facet of an organization's internal context, significantly affects employees' behaviour and performance at various levels. Notably, research by Rožman and Štrukelj (2021) underscores the need for firms to recognize and enhance climate components that boost project performance and engagement. Effective internal communication and cooperation emerged as vital contributors to employees' performance (Li and Mahadevan, 2017). Additionally, workplace climate with clear job roles and a positive employee-company relationship are associated with heightened efficiency and productivity (Akbaba and Altındağ, 2016; Bahrami et al., 2016).

5.2. Research gaps and future research directions

Research on the effects of TL and OC on project performance in IR 5.0 has made substantial contributions to the people and organization fields, especially in project management. Due to enormous research on TL and OC, project managers can recognize that each organization possesses an individualized climate that should be understood within the context of that organization and gain assistance in fulfilling their increasing obligations to attain project success from multifaceted perspectives. Nonetheless, several limitations in the scope and the unilateral of the research could impose challenges on the effects of TL and OC on project performance in IR 5.0. Examples include the lack of longitudinal investigations and multinational corporation surveys in TL, the lack of

longitudinal data in innovation, the existence of mono-method bias when examining the relationship between safety climate and TL, and a more comprehensive requirement in the investigation of OC. Drawing upon the co-occurrence of keywords analysis, mainstream research topics, and identification of research gaps, a research framework delineating potential future research directions is presented in Figure 4.

<center><Please insert Figure 4 about here></center>

5.2.1. *Longitudinal investigations and multinational corporation surveys in transformational leadership (TL)*

The primary focus of the literature on TL centered around the potential performance implications associated with this leadership style (Ahmad et al., 2020; Raziq et al., 2018; Aga et al., 2016). According to Lee et al. (2020), it is likely that future leadership studies will still focus on TL. While research regarding TL remains beneficial to project stakeholders, there are limited research studies on exploring the complexity, ethical, shared, and collective forms of leadership, including communication and team building (Ahmad et al., 2020; Zhang et al., 2017). In addition, previous studies used many indicators when examining the relationship between TL and project performance (Fareed et al., 2021; Aga et al., 2016). As such, the findings suggest that these indicators contribute to the enhancement of project performance. However, there may be relatively strong overlaps between different indicators. Furthermore, a cross-sectional approach was employed in previous studies, which constrains the ability to conclude causal pathways (Fareed et al., 2021; Aga et al., 2016). Consequently, the reported result could potentially be influenced by national culture, given that the collected data were mainly obtained from a single country. For example, Zhang et al. (2017) and Fareed et al. (2021) collected data from participants in China and Pakistan, respectively. In this regard, it would be prudent to ascertain whether previous findings could be replicated within other national cultural contexts. Hence, it is recommended to explore longitudinal investigation of TL across the project lifecycle and project performance. Alternatively, future research studies should employ experimental research designs, through variable manipulation, which may offer a more effective means of identifying causal associations. Moreover, surveys could be done in multinational corporations to eliminate the impact of a single national culture.

5.2.2. *Scope and longitudinal data in innovation*

Several previous studies have highlighted how TL promotes knowledge integration and enhanced project performance by directly influencing innovation and the close relationship between innovation and TL that encourages employees' engagement and skill development (Pham et al., 2023; Begum et al., 2022; Alblooshi et al., 2021; Shanker et al., 2017; Mazzola et al., 2015). Relative to alternative research disciplines, there exists a scarcity of research that substantiates the association between TL and innovation in the construction industry, food and beverage corporations, and other small and medium enterprises (Pham et al., 2023; Silva, 2014; Fonseka et al., 2021). In addition, the outcomes are contextualized within the viewpoints of the surveyed individuals employed within companies, including consultants and contractors. Accordingly, other

project stakeholders are not included (Pham et al., 2023). Besides, most studies employed a cross-sectional design, lacking temporal evidence of relationships between the analyzed variables. As a result, the exploration of long-term effects was precluded (Pham et al., 2023; Begum et al., 2022; Mazzola et al., 2015). Therefore, it is recommended that future research should employ diverse longitudinal studies to scrutinize the enduring impacts of TL and organizational learning on innovation. The acquisition of longitudinal data, featuring time intervals between variables, holds significant value as a progressive stride in subsequent inquiries. Also, future research studies should encompass other stakeholders within the supply chain such as suppliers and owners to provide a more comprehensive elucidation of the influence of TL on innovation within enterprises.

5.2.3. Mono-method bias and universality of safety climate

Regarding safety climate, previous research may have several limitations. Firstly, the utilization of surveys to collect self-reported data on behaviours specifically related to safety leadership, safety performance, and perspectives introduces the possibility of mono-method bias (Lingard et al., 2019; Mullen et al., 2017). Determining whether a leader exhibits traits like inspirational motivation or intellectual stimulation heavily relies on the perceptions or subjectivity of the leader's employees (Hoffmeister et al., 2014). Secondly, the extent to which the outcomes can be extrapolated to different environments and organizational contexts might be low (Mullen et al., 2017). Therefore, future research should empirically assess the relationships between perceived safety responsibilities of employers, safety-specific leadership, and employee safety outcomes within diverse occupational environments, as well as across various age groups. Thirdly, the mono-method bias may be lessened by including assessments of a leader's performance from different subordinates. It is also necessary to gather data from a variety of sources, such as leader assessments of staff safety performance behaviour, to reduce common method variance. However, executing such methods might be challenging due to sample size constraints and the diverse nature of leadership environments across different industries.

5.2.4. More comprehensive analyses of organizational climate

In the assessment of OC, existing studies have focused on limited aspects. For example, leadership, interactions among employees, their dedication to the organization, employees' satisfaction, and employees' motivation (Rožman and Štrukelj, 2021; Li and Mahadevan, 2017; Shanker et al., 2017; Kissi et al., 2012). Future research may ascertain the statistically significant effect of each facet on employees' work engagement (Rožman and Štrukelj, 2021). Therefore, it is suggested that future studies should conduct a more comprehensive investigation of distinct OC components through the utilization of structural equation modelling. Moreover, future research may investigate how OC varies across various business sectors, industries, and settings. This investigation could identify the related climate since different sectors and settings have different cultures (Rožman and Štrukelj, 2021). Based on the surveys, managers were the main research participants (Rožman and Štrukelj, 2021; Shanker et al., 2017). Therefore, a wider range of sample sizes should be considered for future studies to enable more reliable analyses. It could be important to incorporate similar

653 characteristics utilizing information gathered from the organization's workers or lower-level
654 managers.
655

656 **6. Conclusions**
657 This review study aims to conduct a systematic literature review on the effects of TL and OC on
658 project performance in IR 5.0, and to identify mainstream research topics, research gaps, and future
659 research directions. The adopted methods involved a four-stage systematic review process
660 encompassing the identification of documents, screening, eligibility, and included articles.
661 Moreover, a science mapping analysis was conducted to enhance the identification of mainstream
662 research topics, research gaps, and future research directions. The results reported on the annual
663 publication trends, co-occurrence of keywords, and document analysis related to TL and OC on
664 project performance in IR 5.0. Keyword co-occurrence analysis highlighted prominent terms such
665 as "leadership", "innovation", and "transformational leadership", signifying their extensive
666 exploration within this research field. The qualitative discussion focused on four primary
667 mainstream research topics, namely (1) TL in project management; (2) the relationship between
668 TL, OC, and innovation; (3) safety climate; and (4) OC in project management. Moreover, the
669 review study identified four discernible research gaps and future research directions that could
670 yield valuable insights for both researchers and practitioners. They include (1) longitudinal
671 investigations and multinational corporation surveys in TL; (2) scope and longitudinal data in
672 innovation; (3) mono-method bias and universality of safety climate; and (4) more comprehensive
673 analyses of OC.
674

675 *6.1. Theoretical contributions*
676 This review study contributes to the project management literature by analyzing the effects of TL
677 and OC on project performance in IR 5.0. It employs both a systematic literature review (i.e.,
678 PRISMA guidelines) and science mapping analysis (i.e., VOSviewer). The present review study
679 identified several research gaps such as a lack of longitudinal investigations and multinational
680 corporation surveys in TL, the existence of mono-method bias when examining the relationship
681 between safety climate and TL, which may provide directions for future studies and advance the
682 understanding of the effects of TL and OC on project performance in IR 5.0. As such, the identified
683 research gaps would be useful for other researchers interested in the studied research domain to
684 extend the research on the effects of TL and OC on project performance in IR 5.0. By developing
685 a framework for TL, OC, and project performance, this study has significantly laid an important
686 foundation and provided insightful viewpoints on the analysis of relevant studies on the effects of
687 TL and OC on project performance in IR 5.0.
688

689 *6.2. Implications for practice*
690 A range of practical implications could be inferred from the present review study. Firstly, it
691 underscores the significance of TL in project management and proper OC in a corporation. This
692 suggests that the effective utilization of TL or OC could increase the likelihood of better project

693 performance. Secondly, it would provide a deeper understanding to project managers on TL
694 techniques and establish a favourable OC within the context of IR 5.0 era. This includes inspiring
695 and motivating team members, providing intellectual stimulation, and fostering individualized
696 consideration. Moreover, project managers should view TL and OC as ongoing processes that
697 require continuous evaluation and improvement. This may involve soliciting feedback from team
698 members, conducting regular assessments of organizational culture, and adapting leadership
699 approaches to suit evolving project dynamics and industry trends. Ultimately, the goal of
700 incorporating TL and fostering a positive OC is to achieve improved project performance. Project
701 managers should prioritize initiatives aimed at enhancing leadership effectiveness and
702 strengthening OC as integral components of their project management strategy.
703

6.3. Limitations and further studies

705 Like other review studies, the current review study has some limitations. Firstly, Scopus was the
706 only database employed in this research to select relevant articles. Since indexing criteria used by
707 other databases may differ, relying only on a single database may increase the risk of bias or
708 unintentionally excluding research articles, particularly those with null or insignificant findings.
709 Secondly, the type of articles was confined to journal articles throughout the studied period.
710 However, journal articles might not include all available research on the particular subject. It may
711 be possible to remove pertinent research that has been published in conference proceedings or
712 other types of grey literature, leading to incomplete evidence. In addition, there may also be a
713 delay between an accepted article and its final online publication date. Thirdly, English was used
714 as the only language when screening articles. Research scholars around the world may publish
715 their results in a variety of languages. By restricting the search to articles published in English
716 language, relevant studies written in other languages could be overlooked.
717

718 Therefore, it is recommended that future studies should consider other databases. For example,
719 "Web of Science" and "Science Direct" may be included in the literature search. Moreover, the
720 inclusion criteria for future research may incorporate different types of sources such as books, and
721 conference papers. Finally, other languages should be included in future review studies, especially
722 if the studied research domain has a noteworthy global impact.
723

Declaration of Interest Statement
725 The authors report there are no competing interests to declare.
726

Data Availability Statement
728 The data that support the findings of this study are available from the corresponding author upon
729 reasonable request.
730

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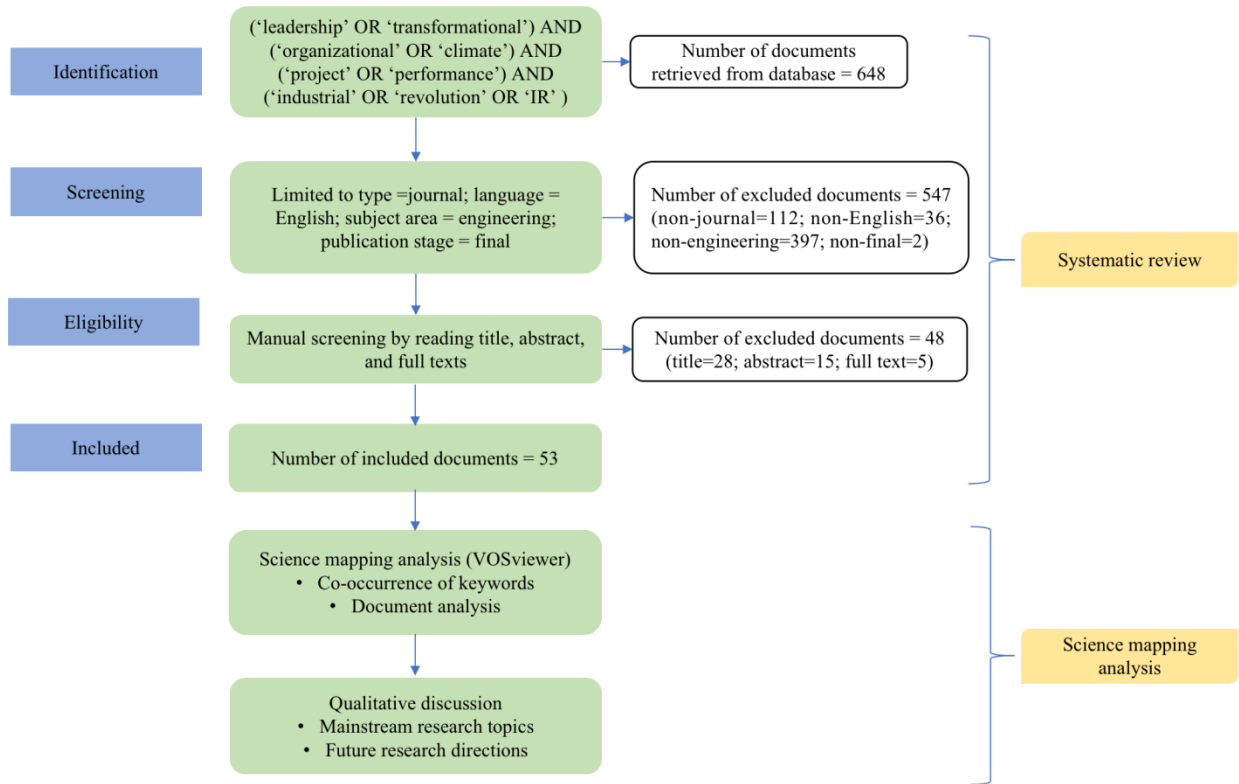
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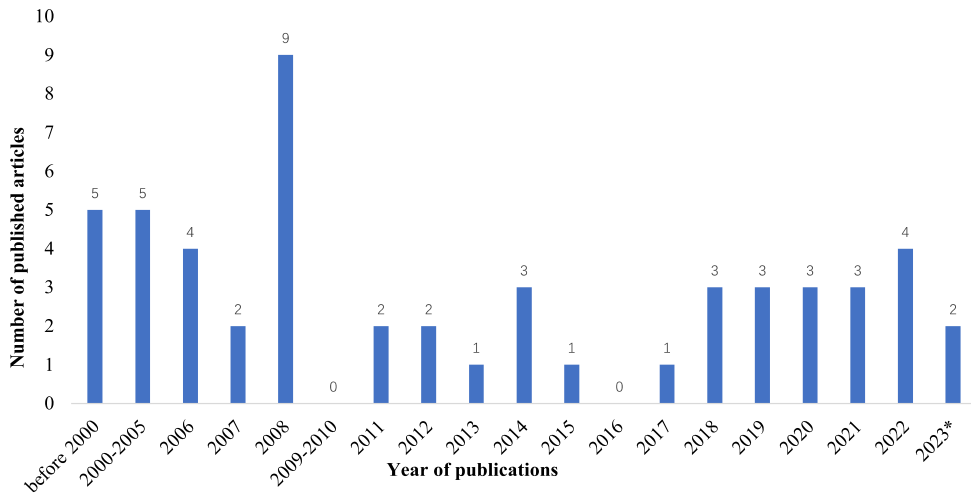**Figure 1.** Outline of research methods (**Source:** Authors own work)

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1208 **Figure 2.** Annual distribution of journal articles

1209 Note: 2023* indicates that the number of published articles was obtained at the end of 15 July

1210 2023 (**Source:** Authors own work)

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1213 **Figure 3.** A network of co-occurrence of author keywords (**Source:** Authors own work)

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Existing Research Areas	Research Themes	Future Research
Mediating factors between transformational leadership and project performance	Transformational leadership in project management	Longitudinal investigations and multinational corporation survey in transformational leadership
Effects of transformational leadership on innovation; mediators in innovation	The relationship between transformational leadership, organizational climate, and innovation	Wider scope and longitudinal data in innovation
Crucial role of transformational leadership in improving project safety performance	Safety climate	Mitigating mono-method bias and achieving universality of safety climate
The positive role of organizational climate in project performance	Organizational climate in project management	Conducting more comprehensive analysis of organizational climate

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1217 **Figure 4.** Research framework linking existing research areas to future research directions
1218 (**Source:** Authors own work)

1219 **Table 1.** Eligibility criteria of literature samples

No.	Inclusion criteria
1	Type: Journal article
2	Language: English
3	Subject area: Engineering
4	Publication stage: Final
5	Studies that involved the relationship between transformational leadership and project performance
6	Studies that involved the relationship between organizational climate and project performance
7	Studies that involved the effect of transformational leadership and organization climate on project performance in the industrial revolution era

(**Source:** Authors own work)

Table 2. List of selected keywords and relevant network data

Keywords	Occurrences	Average publication year	Links	Average citations	Average normalized citations	Total link strength
Leadership	12	2011	9	32.42	0.99	12
Safety Climate	4	2014	2	38.00	1.28	3
Transformational Leadership	4	2014	3	86.75	1.70	3
Safety Performance	3	2017	1	11.33	0.61	2
Innovation	3	2011	4	77.67	0.90	5
Continuous Improvement	3	2002	3	17.00	0.88	3
Organizational Culture	3	2014	2	86.00	1.15	3
Performance Management	2	2010	3	80.00	2.05	3
Market Orientation	2	2011	4	4.00	0.06	4
Project	2	2010	4	7.00	0.08	5
Leadership Style	2	2005	3	4.00	0.54	3
Manufacturing	2	2004	4	7.00	0.56	4
Performance	2	2013	2	128.50	1.08	2

(**Source:** Authors own work)

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1231 **Table 3.** Summary of highly cited published articles

Article	Title	Total citation	Normalized citation
Pal et al. (2014)	Antecedents of organizational resilience in economic crises - An empirical study of Swedish textile and clothing SMEs	261	1.97
Lloréns Montes et al. (2005)	Influence of support leadership and teamwork cohesion on organizational learning, innovation and performance: An empirical examination	209	1.00
García-Morales et al. (2006)	Antecedents and consequences of organizational innovation and organizational learning in entrepreneurship	188	2.71
Scott-Young et al. (2008)	Project success and project team management: Evidence from capital projects in the process industries	141	3.13
Valmohammadi et al. (2015)	The guidelines of improvement: Relations among organizational culture, TQM and performance	123	1.00
Limsila & Ogun lana (2008)	Performance and leadership outcome correlates of leadership styles and subordinate commitment	95	2.11
Eid et al. (2012)	Leadership, psychological capital and safety research: Conceptual issues and future research questions	86	1.95
Fonseca et al. (2021)	Quality 4.0: The efqm 2020 model and industry 4.0 relationships and implications	73	2.19
Zhou et al. (2018)	Does seeing "mind acts upon mind" affect green psychological climate and green product development performance? The role of matching between green transformational leadership and individual green values	66	1.00
Ángel Del Brío et al. (2008)	Human resources in advanced environmental approaches-a case analysis	61	1.36
O'regan & Ghobadian (2006)	Perceptions of generic strategies of small and medium sized engineering and electronics manufacturers in the UK: The applicability of the Miles and Snow typology	59	0.85
Sirvanci (2004)	Critical issues for TQM implementation in higher education	58	1.38
Hirtz et al. (2007)	The effects of leadership on quality	41	1.71

Reniers et al. (2011)	Continuously and simultaneously optimizing an organization's safety and security culture and climate: The Improvement Diamond for Excellence Achievement and Leadership in Safety & Security (IDEAL S&S) model	34	2.00
Begum et al. (2022)	Achieving green product and process innovation through green leadership and creative engagement in manufacturing	33	3.22
Ahuja & Khamba (2008)	Justification of total productive maintenance initiatives in Indian manufacturing industry for achieving core competitiveness	33	0.73
Lee et al. (2008)	Developing new products in a network with efficiency and innovation	33	0.73
Haikonen et al. (2004)	Exploring Six Sigma and CI capability development: Preliminary case study findings on management role	26	0.62
Khalid et al. (2021)	Safety Management System (SMS) framework development – Mitigating the critical safety factors affecting Health and Safety performance in construction projects	26	0.78
(**Source:** Authors own work)			

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