Organizational Leadership and Employee Well-being in the Construction Industry: A Bibliometric and Scientometric Review

Jiaqi SHI[a], Maxwell Fordjour ANTWI-AFARI[b*]

[a]Department of Mechanical, Aerospace and Civil Engineering, Faculty of Science and Engineering, University of Manchester, Manchester, M13 9PL, United Kingdom. Email: sjq0708@126.com

[b]Department of Civil Engineering, College of Engineering and Physical Sciences, Aston University, Birmingham, B4 7ET, United Kingdom. Email: m.antwiafari@aston.ac.uk

***Corresponding author:**

Department of Civil Engineering, College of Engineering and Physical Sciences, Aston University, Birmingham, B4 7ET, United Kingdom. Email: m.antwiafari@aston.ac.uk

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Abstract

Purpose – The construction industry has been identified as one of the most challenging sectors for stakeholders to achieve organizational success. Although previous studies had examined both organizational leadership (OL) and employee well-being (EWB) in the construction industry (CI), a bibliometric and systematic analysis of published articles is hitherto lacking. Therefore, this review paper aims to conduct a bibliometric and scientometric review of published articles related to OL and EWB in the CI between 2008 and 2022.

Design/methodology/approach – A three-step method consisting of a bibliometric analysis, a scientometric analysis, and an in-depth discussion was used. A total of 1,114 articles met the inclusion criteria. All articles were retrieved from the Scopus database.

Findings – The results present an in-depth discussion of the research publication trends, keywords co-occurrence analysis, document analysis, and countries/regions analysis. This review paper identified three main research gaps in OL and EWB in the CI, namely, project management, technology innovation, and people orientation. It also proposes “OL-EWB in the CI" mechanisms and a theoretical framework to guide future research directions.

Originality – This review paper theoretically fills the gap in the lack of research summarizing OL and EWB in the CI, and provides research gaps and trends for achieving a win-win situation for both companies and employees.

Keywords: Bibliometric; Scientometric; Organizational Leadership; Employee Well-being; Construction Industry

Paper type: Literature review

1. Introduction

The construction industry (CI) has many positive impacts on economic development, but also faces severe challenges for stakeholders to achieve organizational success (Potter *et al.*, 2018). Employees must work for long hours and are also exposed to hazardous environments and health issues (Lingard and Sublet, 2002; Ogbu and Adindu, 2019; Taofeeq *et al*., 2020; Anwer *et al.,* 2021; Cheung *et al.,* 2023), making it difficult for them to maintain high levels of work dedication (Coetzer *et al.*, 2017). According to the National Institute for Occupational Safety and Health (NIOSH), it was reported that 51.1% of 106,393,927 construction employees worked in vapor, gas, dust, or fume environments, 72.7% were required to work outdoors, 31.2% faced potential skin hazards, and 44.1% had non-standard work arrangements (NIOSH, 2022). In addition, 18.6 % of construction employees reported working more than 48 hours per week while 7.2 % reported working more than 60 hours per week (NIOSH, 2022). To stabilize finances, enhance corporate competitiveness, mitigate construction injuries, and promote sustainable growth, construction companies must ensure a high level of employee well-being (EWB) (Opoku *et al.,* 2015; Coetzer *et al.,* 2017).

As project management evolves, the CI has shifted its focus on leadership. Leadership is widely recognized as a core influencer for modern organizations and industries to achieve excellence and success (Löwstedt *et al.*, 2021). Successful leadership has been shown to help employees enhance creativity (Shafique *et al.*, 2020), increase self-esteem (Yang *et al.*, 2018), improve productivity (Direction, 2014), strengthen trustworthiness among stakeholders (Zhu *et al.*, 2014). From organizational level perspective, leadership affects employees' behaviour and well-being (Nguyen *et al.*, 2019), resulting in organizational performance (Gang Wang *et al.*, 2011). EWB in the CI is

reflected in a number of aspects such as technical training, company social events, annual medical checkups, etc. (Karakhan *et al.,* 2023). Leadership and EWB are two key factors in project and organizational performance (Cheung *et al.,* 2023). Technology innovation contributes to organizational leadership (OL) implementation and EWB realization. For example, establishing an effective communication policy for building information modelling (BIM) implementation enhances trust among team members, which improves the overall stakeholders' satisfaction within the project (Kineber *et al.,* 2023a; Villena Manzanares *et al.,* 2023). Constructive or destructive leadership may exist in BIM-based construction projects (Omer *et al.,* 2022).

Conducting a literature review helps to gain an in-depth understanding of a research area (Martinez *et al.*, 2019). Previous review studies on OL and EWB have been found in extant literature. Inceoglu *et al.* (2018) examined how four leadership behaviours affect EWB. Avolio *et al.* (2009) reviewed various types of leadership theories and recommended future research directions. Toor, and Ofori (2008a) discussed leadership characteristics in the context of construction projects, emphasizing that true leaders should possess positive values, a high level of ethics and morality, and view the interests of their followers above personal interests. However, the aforementioned review articles lack sufficient discussion and in-depth research on both OL and EWB in the CI. Moreover, very few review articles in this field have used both bibliometric and scientometric analyses. Furthermore, the current review proposes a theoretical framework for OL and EWB in the CI, that would enhance project performance and employees' wellbeing. Therefore, this study aims to conduct a bibliometric and scientometric review of OL and EWB in the CI over the past 15 years by answering the following questions:

1. What are the publication trends of articles on OL and EWB in the CI?

2. What are the influential keywords, documents, and countries/regions' analyses on OL and EWB in the CI?
3. What is the theoretical framework of OL and EWB in the CI?

Although the above research questions are interrelated and methodologically (i.e., bibliometric and scientometric) aligned to each other, the third research question was used to develop a theoretical framework on OL characteristics, EWB indicators, project management and performance. The proposed framework would help achieve a win-win situation for both companies and employees. To achieve the overarching aim of this review study, the following specific research objectives are set:

1. Analyze the research publication trends on OL and EWB in the CI.
2. Apply scientometric analysis to visualize keywords, documents, and countries/regions impacts in the field of OL and EWB in the CI.
3. Propose a theoretical framework of OL and EWB in the CI.

The remaining sections of this review paper are as follows. Section 2 discusses the research methodology. Section 3 presents the results and discussion of research publication trends, keyword co-occurrence analysis, document analysis, countries/regions analysis, research gaps, and trends. Lastly, the conclusions are summarized in Section 4.

2. Research methodology

The present review paper provides a comprehensive review of research on OL and EWB in the CI by using secondary data. To reduce the bias of subjective judgment and enhance the depth of understanding, this review paper adopted a "mixed-method approach", which combines both quantitative review (i.e., bibliometric and scientometric analyses) and qualitative review (Heyvaert

115 *et al*., 2017). The advantage of this approach is to simultaneously inherit different discussions and
116 methods of analysis (Heyvaert *et al.,* 2017). As such, the research methodology is divided into
117 three steps, namely, bibliometric analysis, scientometric analysis, and in-depth discussion. Fig. 1
118 illustrates an overview of the research methodology. Details of each methodological step are
119 discussed in the subsequent subsections.

120 <Please insert Figure 1 about here>

121 ***2.1. Bibliometric analysis***

122 Bibliometric analysis has been widely used in multiple fields during the last decade, resulting in
123 many highly influential studies in the fields of management, marketing, construction, circular
124 economy, finance, etc. (Antwi-Afari *et al.,* 2021; Mukherjee *et al.,* 2022; Wu *et al*., 2022).
125 Compared to other methods, it offers a more objective presentation of facts and covers a broader
126 range of topics (Donthu *et al.,* 2021).

127

128 As shown in Fig. 1, the first step in conducting a bibliometric analysis is to define the literature
129 scope. A clear scope can be beneficial for identifying subsequent identification of research trends,
130 methodological challenges, and future directions. This study selected Scopus as the literature
131 search database because it has a broader coverage of published articles than other databases
132 (Chadegani *et al.,* 2013).

133

134 The literature documents were retrieved from the Scopus database by searching within the “article
135 titles, abstracts, keywords” using search terms such as “leadership”, “well-being”, “construction”
136 or other related synonyms. The Boolean operator "AND" was used between the three key terms
137 (“leadership”, “well-being” and “construction”) to ensure that the retrieved articles are related to

all of them. The Boolean operator "OR" was used between related synonyms to ensure that no duplicate filters are applied to the same article. According to the purpose of this review study, the selected keywords are: (“leadership” OR “leaders” OR “leader” OR “project manager”) AND (“well-being” OR “wellbeing” OR “welfare” OR “happiness” OR “benefit” OR “benefits”) AND (“construction” OR “construction project” OR “construction industry”). Initially, 1,738 literature documents were retrieved from the Scopus database in the first stage. The second stage of screening was limited to the “subject area”. Based on the purpose of this study, literature documents that do not focus on both OL and EWB in the CI were excluded. Consequently, subject areas that have no connection to the studied domain were excluded. For example, “Veterinary” and “Chemistry” literature documents were excluded. As such, literature documents in the following subject areas were retained: “Engineering”, “Business, Management and Accounting”, “Social Sciences”, “Environmental Science”, “Economics, Econometrics and Finance” and “Psychology”. A total of 122 literature documents were excluded in the second stage. Next, the publication period and document types were screened in the third and fourth stages, respectively. The search period was set to include the last 15 years, thus, from 2008 to mid-2022 (years inclusive). At the third screening, 1,362 literature documents were retained. Only literature documents published as articles in peer-reviewed journals or conference proceedings are selected in the fourth stage. As a result, literature documents like book reviews or reports were excluded because they have different formats in terms of providing detailed research methods and outcomes. At the fourth screening stage, 1,213 articles were obtained. In the next screening stage, articles were limited to those written in “English” language to facilitate subsequent review, understanding, and analysis. At the end of the fifth screening stage, 43 articles were excluded, thus, remaining 1,170 articles. The final stage of the screening process is the manual review, where the abstract and full text of each article

were carefully read to include those relevant to the studied domain. For example, an article that embodied "benefits", "manager", and "construction" in its abstract and met all other inclusion criteria was manually excluded because it explored the benefits of SCADA gateways and industrial access managers for DER customers (Steel and Signoretto, 2021). Articles that were unrelated to the purpose of this research study were manually identified and excluded. After rigorous screening as described above, 1,114 published articles were retained for this study. Table 1 shows the full-stage details of the screening process discussed above.

<Please insert Table 1 about here>

2.2. Scientometric analysis

Scientometric analysis is considered as a quantitative research method that has notably contributed to scientific research development (Yalcinkaya and Singh, 2015). It allows for assessing the impact of research, measuring the relevance between articles, and mapping the evolution of knowledge in a particular field (Martinez et al., 2019; Antwi-Afari et al., 2023). Using this method can effectively circumvent the adverse effects of subjective bias on research (Pollack and Adler, 2015).

The second step of this review study relies on scientometric analysis. VOSviewer was used as a software tool for conducting scientometric analysis. VOSviewer is a unique open-source software tool that is ideally suited for the analysis of academic literature and virtual bibliometric networks. It shows the distances and connection lines between nodes to reflect their closeness (Van Eck and Waltman, 2014). This review paper presented the knowledge networks of OL and EWB in the CI based on keywords co-occurrence, document, and countries/regions analyses. The networks seek to provide data to support subsequent discussion.

2.3. In-depth discussion

After the quantitative analysis (i.e., steps 1 and 2), this review paper systematically discusses OL and EWB in the CI in section 3. This step is closely linked to the previous steps in bibliometric and scientometric analyses. During the in-depth discussion, the present study conducts a comprehensive examination of the included articles (i.e., 1,114 articles) to identify research gaps and future research trends. In addition, it presents the "OL-EWB in the CI" mechanisms and theoretical framework which demonstrate the relationships between research subjects and highlight the main contributions of this study.

3. Results and discussion

3.1. Research publication trends on OL and EWB in the CI

It was reported that 1,114 articles were identified following the “mixed-method approach” in section 2, including 746 journal articles and 368 conference articles. Table 2 shows the number of published articles in 15 top peer-reviewed journals and top 5 conference proceedings on OL and EWB in the CI from January 2008 to June 2022.

<Please insert Table 2 about here>

Peer-reviewed journals dominated the list of published sources with 357 articles out of 539. The *Journal of Construction Engineering and Management* has the highest number of publications (i.e., 52 articles) on this research topic. The second highest number of published articles was *Engineering Construction and Architectural Management*. These two peer-reviewed journals contributed to 12.2% of total publications. The *Journal of Management in Engineering*, *Construction Management and Economics,* and *International Journal of Project Management* followed in third to fifth places, with 22, 19, and 17 articles, respectively.

Conference proceedings also shared articles on this research topic. *Procedia Engineering* had the highest number of articles with 11 publications, with *AACE International Transactions* emerging in second place. As shown in Table 2, there are not many relevant articles in the top 5 conference proceedings as compared to peer-reviewed journals. Journal articles have a continuous trend of annual publications, whereas conference articles are published sporadically. However, a total of 368 articles have been published in 182 conference proceedings between 2008 and 2022. It indicates a relative distribution of conference articles in different publication sources.

Fig. 2 shows the annual publication trends of published articles in peer-reviewed journals and conference proceedings. The published articles on OL and EWB in the CI have shown an upward trend since the beginning of 2014. The steady annual growth rate of nearly 20% for four consecutive years (i.e., 2016 to 2019) indicates a gradual increase in researchers and stakeholders' attention to this research topic. It is worth noting that the included published articles for 2022 only cover publications in the first six months, resulting in a fewer number of published articles. By conducting a linear regression (with a confidence interval of 95%) analysis in Microsoft Excel, it was predicted that the number of published articles on OL and EWB in the CI will increase annually. For example, it was predicted that 150 articles will be published in 2024.

<Please insert Figure 2 about here>

3.2. Keywords co-occurrence analysis

VOSviewer was used to generate the network of keywords co-occurrence analysis in this study. Keywords reflect the core content of an article (Van Eck and Waltman, 2009). Compared to index keywords, author keywords are more representative of an article's research area, making them more suitable for bibliometric analysis (Oraee *et al.*, 2017). The results generated by VOSviewer

230 are distance-based maps, where strong relationships between any two nodes indicate their
231 closeness to each other (Perianes-Rodriguez *et al.*, 2016). Label size is proportional to occurrence
232 frequency whilst label colour can be used to categorize different subject areas (Oraee *et al.*, 2017).
233
234 The first step in keywords co-occurrence analysis is to combine similar keywords to reduce
235 subjective bias. For example, "building information modelling" and "BIM" have similar meaning,
236 thus, they are combined as "BIM". Since data pre-processing is essential, this step also helps to
237 report accurate results.
238 The second step is keywords filtering. Since the purpose of this study is OL and EWB in the CI,
239 some general keywords such as "construction industry", "leadership" and "well-being" appeared
240 frequently. Consequently, general keywords such as "construction", "leadership" and "well-being"
241 were excluded since they are same as the search terms (Jin *et al.*, 2019). Including keywords that
242 are similar to the search terms in this study would lead to unnecessary visual clutter and statistical
243 artifacts. In addition, country/region keywords were also excluded.
244
245 A total of 3,050 author keywords were obtained from 1,114 articles. By setting the minimum
246 number of occurrences at 5 in VOSviewer, 98 keywords met the criteria. After combining similar
247 keywords, 67 keywords remained. Next, country/region keywords were excluded, resulting in a
248 total of 53 keywords. Fig. 3 illustrates the keyword co-occurrence network analysis, consisting of
249 53 nodes, 8 clusters, 200 links, and 306 total link strengths. Table 3 summarizes the list of
250 keywords on the studied topic.

251 <Please insert Figure 3 about here>

252 <Please insert Table 3 about here>

253 As shown in Figure 3, VOSviewer outputs include occurrences, average publication year, links,
254 and total link strength. Analyzing research trends requires horizontal consideration of keyword
255 popularity and vertical reference to temporal factors. It can be seen from Table 3 that the average
256 publication year on OL and EWB in the CI ranges from 2012 to 2021. The keyword co-occurrence
257 analysis reveals a shift in research perspective from management level, which focuses on project
258 output, to employee level, which focuses on health and safety.
259
260 Figure 3 and Table 3 explain the keywords co-occurrence analysis on OL and EWB in the CI. The
261 top three keywords that appear most frequently are “BIM”, “project management”, and
262 “sustainable development” with 72, 58, and 58 occurrences, respectively. In Figure 3, it was found
263 that these keywords have the largest nodes and connection links. These phenomena indicate that
264 “BIM”, “project management”, and “sustainable development” are the most popular keywords in
265 the study of OL and EWB in the CI. Based on the average publication year, research articles
266 published on or before 2015 addressed project issues from a business perspective. During this
267 period, keywords included “project management”, “project performance”, “sustainable
268 development”, “decision-making”, “productivity”, “procurement”, and “knowledge management”.
269 In particular, “project management” and “sustainable development” emerge at the second and third
270 positions based on frequency of occurrences. “Project management” had the highest total link
271 strength, indicating that it is closely linked to other nodes. There was a shift in research focus on
272 the studied field from 2016 to 2017 (years inclusive). Published articles tend to focus on the impact
273 of people on projects. As such, keywords were no longer only limited to projects. Many published
274 articles were related to psychological and physical characteristics such as “health and safety”,
275 “collaboration”, “innovation”, “trust”, “teamwork”, etc. In 2018, scholars started to introduce

advanced digital technologies. BIM became the most widely adopted advanced digital technology within the studied field. In addition, Covid-19 has recently received global attention in this research field.

3.3. Document analysis

VOSviewer was also used to analyze the impact of documents on OL and EWB in the CI. By setting the minimum number of citations at 50 in VOSviewer, 73 articles met the threshold. The top 20 most influential articles are summarized in Table 4. The ranking in Table 4 is based on the normalized citations. The normalized citations represent the normalized number of citations received by a document.

All the top 20 articles listed in Table 4 are peer-reviewed journal articles, indicating an absolute dominance of journal influence. The average year of publication was found between 2008 and 2019. The highest number of citations (i.e., 393) and the highest normalized citations (i.e., 19.87) were both attributed to Eadie *et al.*, 2013. The document analysis presented in Table 4 may be broadly divided into three categories. The first document category is focused on advanced digital approaches/technologies such as BIM, lean construction (e.g., Eadie *et al.*, 2013; Sacks *et al*. 2010). The second document category is closely related to leadership or EWB (Fisher, 2011; Bowen *et al.,* 2014). For example, Fisher (2011) discussed the skills and behaviours expected of project managers. Bowen *et al.* (2014) focused on the factors influencing occupational stress in project consultants. The third document category focused on a specific country/region, or company as well as a case study methodological research approach (e.g., Ding *et al.* 2015; Yu *et al.* 2013).

<Please insert Table 4 about here>

3.4. Countries/regions analysis

Fig. 4 illustrates the number of publications by countries/regions related to OL and EWB in the CI. The United States of America, United Kingdom, Australia, and China Mainland occupy the top four positions. The United States of America emerged on top of the list with 331 publications and 4,702 citations, almost doubling the gap with the United Kingdom in second place. The United Kingdom, China Mainland, and Australia are in similar echelon with little differences in number of published articles. The cumulative citations in the top four countries exceeds 10,000, indicating the global importance of this research topic.

<Please insert Figure 4 about here>

This study also used VOSviewer to generate a network of countries/regions' influence, showing their research contributions, and interrelated links. First, “co-authorship” was selected for analysis in VOSviewer. Then, the “unit of analysis” is set to “countries” using full counting method. Next, countries/regions are set to have at least one published document and five citations, resulting in a total of 71 countries/regions.

Figure 5 and Table 5 show the network and top 20 influential countries/regions related to OL and EWB in the CI, respectively. Notably, the ranking of countries/regions in Table 5 is based on total link strength. It can be seen from Fig. 5 and Table 5 that the United States of America, Australia, China Mainland, and United Kingdom occupied the top four places since these countries had the highest number of documents, citations, and total link strength. These countries are also prominent in their collaborative impact, but the cooperation between Australia and the United States of America is not evident. The strong links between the United States of America and other countries are expected due to the highest number of publications. Surprisingly, the United Kingdom ranks

behind China Mainland and Australia in total link strength, although it leads in number of documents and citations. It is worth noting that Canada, although having fewer number of documents than the United Kingdom, has good links to countries like the United States of America, China Mainland, and Australia. Iran and India, as developing countries, are ranked 8 and 12 according to their total link strengths of 18 and 10, respectively. In contrast, Singapore and Spain, as developed countries, are both ranked at the bottom of Table 5 with the same total link strength of 7. These results show that the research studies on OL and EWB in the CI are widely studied globally.

<Please insert Figure 5 about here>

<Please insert Table 5 about here>

3.5. Theoretical framework for research on OL and EWB in the CI

3.5.1. Research gaps

After quantitative analyses (i.e., bibliometric and scientometric analyses), this review study identifies potential research gaps via in-depth qualitative discussion. They include project management, technology innovation, and people orientation, as seen from section 3.2 keywords co-occurrence analysis.

3.5.1.1. Factors influencing project management effectiveness

Most of the existing studies demonstrated a positive relationship between specific characteristics and project management. For example, Wei et al. (2016) mentioned that conflict management skills

characteristics of project managers contribute to stakeholder management. Wang *et al.* (2016) argued that leadership personality characteristics influence risk management.

However, there are limited research studies linking the salience of specific leadership characteristics to the degree of project management effectiveness. First, an example is leadership demographics characteristics. There are research gaps on OL and EWB in the CI related to age, gender, level of education, geographical area, etc. Second, there is a lack of research on the impact of EWB indicators on project management. As previously mentioned, construction workers are exposed to dangerous environments, working for long hours, and are prone to health issues such as physical fatigue, musculoskeletal disorders, and psychological risk factors which may lead to project safety hazards and risks. Taking from construction workers' well-being perspective, it is worthwhile to investigate how project management measures could influence their health and well-being.

3.5.1.2. The relationships between technological innovations and people orientation

Technological innovations can contribute to promoting project management practices. Previous studies have reported that BIM can identify conflicts (Hamada *et al*., 2016), enhance teamwork (Eadie *et al.*, 2013; Arayici *et al.,* 2011), and assist in the designation of project strategies (Rajabi et al., 2022b), while information and communication technology (ICT) can also enhance team communication (Fulford and Standing, 2014), productivity in construction projects (Hasan *et al.*, 2018b) and increase employee awareness of hazards (Li *et al.,* 2015). Key criteria for technology vary from country to country (Rajabi et al., 2022a). However, there are limited research studies on the relationships between technological innovations and people orientation. For example, future

research studies should compare conflict management characteristics performance of project managers and employee job satisfaction before and after the introduction of advanced digital technologies such as BIM. In addition, the role of ICT in influencing social mediators (e.g., job support, supervisor-worker relationship, coordination, etc.) on the impact of OL and EWB could be explored. In addition, cyber technology application in emerging countries is considerably restricted (Kineber et al., 2023b).

3.5.1.3. The feedback effect of EWB on OL

Extant research studies have focused on the one-way impact of OL on EWB but have neglected the feedback effect of EWB on leadership. Future research studies should focus on the whole process of OL on EWB influence and EWB on OL feedback. By identifying the two-way pathways between OL and EWB, the findings may help project managers and other stakeholders to achieve project success or goals.

3.5.2. Research trends

After quantitative analyses and qualitative discussion, this review study also proposes a theoretical framework for research on OL and EWB in the CI, as shown in Fig. 6. The solid arrows indicate the impact relationships that have been validated. The dashed lines represent future impact relationships that could be conducted in future studies. It should be particularly noted that technological innovations (e.g., BIM, ICT) are considered as advanced digital approaches that may help to improve employees' well-being (e.g., cognitive, hazard recognition) and promote project management practices (e.g., teamwork, communication, coordination). When technological

innovations are applied to specific areas of organizations and their employees, they may have positive or negative impacts.

Based on consensus from existing research findings, the following mechanisms on OL and EWB in the CI are recommended: (1) leadership characteristics may influence EWB indicators through mediators, which may influence project performance, (2) project management is a process by which leadership may influence project performance through various technological innovations, and (3) specific leadership characteristics may contribute positively to specific types of project management.

Future research studies should focus on unproven relationships in Fig. 6. For example, (1) factors influencing project management effectiveness, (2) the relationships between technological innovations and people orientation, and (3) the feedback effect of EWB on OL.

<Please insert Figure 6 about here>

4. Conclusions

This is the first review study on OL and EWB in the CI, by adopting a "mixed method approach" and presenting research gaps, future research directions and a theoretical framework. Specifically, the research methods adopted a three-step process comprising of a bibliometric analysis, a scientometric analysis and an in-depth discussion. Literature documents were retrieved from the Scopus database, and a total of 1,114 articles met the inclusion criteria.

410 In the quantitative research phase, this review study analyzed the annual research publication
411 trends, keyword co-occurrence analysis, document analysis, and countries/regions analysis. The
412 findings reveal that: (1) the number of publications on OL and EWB in the CI is increasing
413 annually; (2) articles on OL and EWB in the CI are mostly published in peer-reviewed journals
414 (i.e., 746 articles) other than conference proceedings (i.e., 368 articles); (3) the top three most
415 popular keywords used in OL and EWB in the CI are "BIM", "project management", and
416 "sustainable development"; (4) recent documents published on OL and EWB in the CI are related
417 to advanced digital approaches such as BIM, lean construction, etc; and (5) United States of
418 America, Australia, China Mainland, and United Kingdom are countries with the greatest influence
419 on the studied domain.
420
421 In the qualitative discussion phase, this review study discussed the research gaps and research
422 trends which led to proposing "OL-EWB in the CI" mechanisms and a theoretical framework. It
423 was recommended that future research studies should focus on (1) the factors affecting project
424 management effectiveness, (2) the relationships between technological innovations and people
425 orientation, and (3) the feedback effect of EWB on OL.
426
427 Theoretically, this review study fills the research gap by summarizing future research direction on
428 OL and EWB in the CI. Specifically, the present review study could provide useful insights for
429 both construction companies and employees. Construction companies can train potential project
430 managers based on their leadership characteristics to fulfill specific leadership roles. Project
431 managers can select the right intermediary pathway to improve project management practices
432 based on EWB indicators. Moreover, the use of advanced digital technologies can improve project

management practices. These measures would not only help construction companies to meet or even exceed project performance targets but also provide a high level of well-being for employees to achieve a win-win situation.

Although this review study has many theoretical and practical contributions, there are still several limitations. Firstly, the included articles were only retrieved from the Scopus database. Secondly, although the present review study included potential searched keywords, it may be possible that some relevant articles were missed. For example, articles related to organizational needs and goals as well as engineering-related keywords. It is recommended that future research studies should use multiple databases and range of searched keywords to achieve a more comprehensive study.

Data Availability Statement

All data generated or analyzed that support the findings of this study are available from the corresponding author upon request.

Declarations of interest

No potential conflict of interest was reported by the authors.

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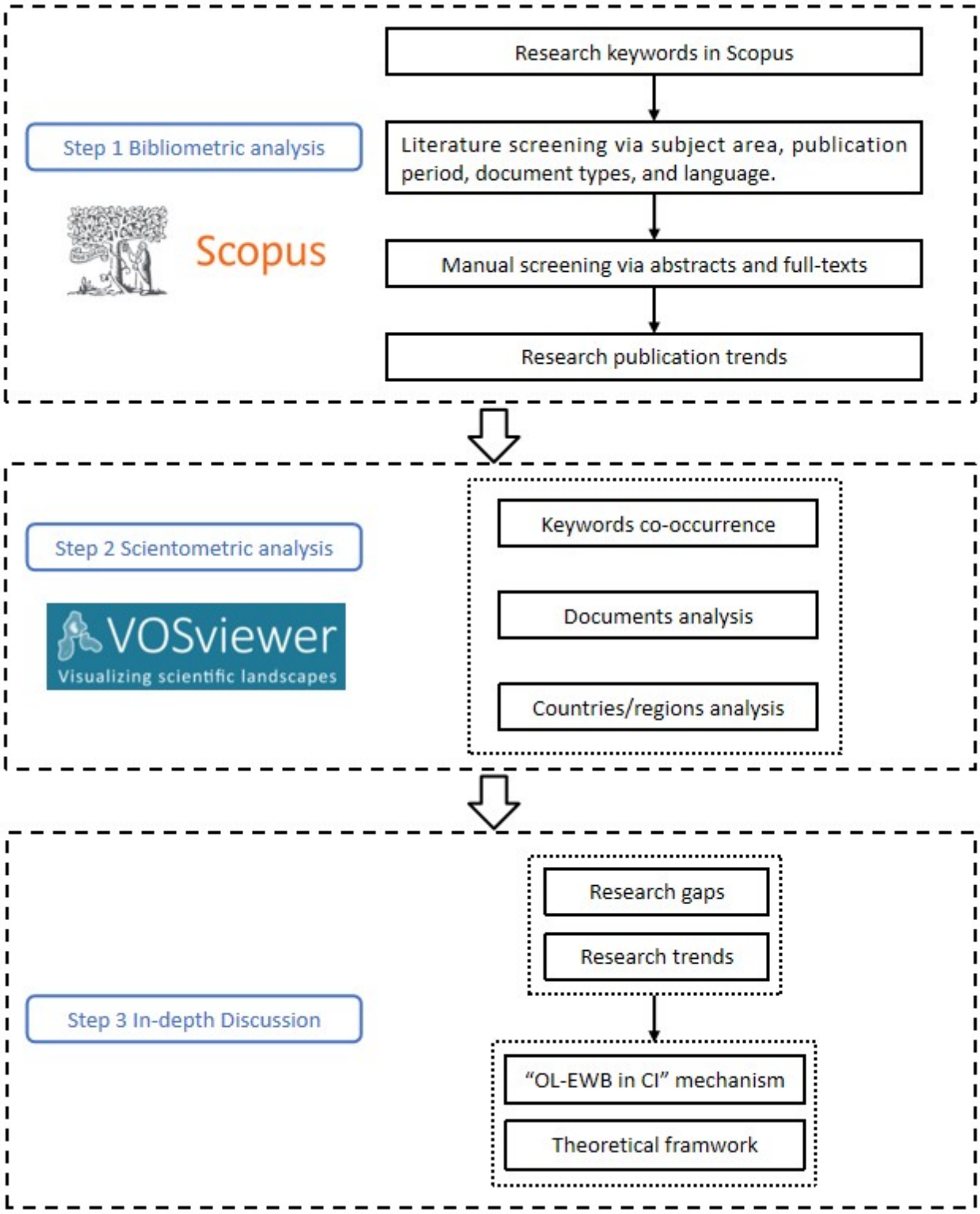


Fig. 1. Overview of the research methodology. Source: Authors own work

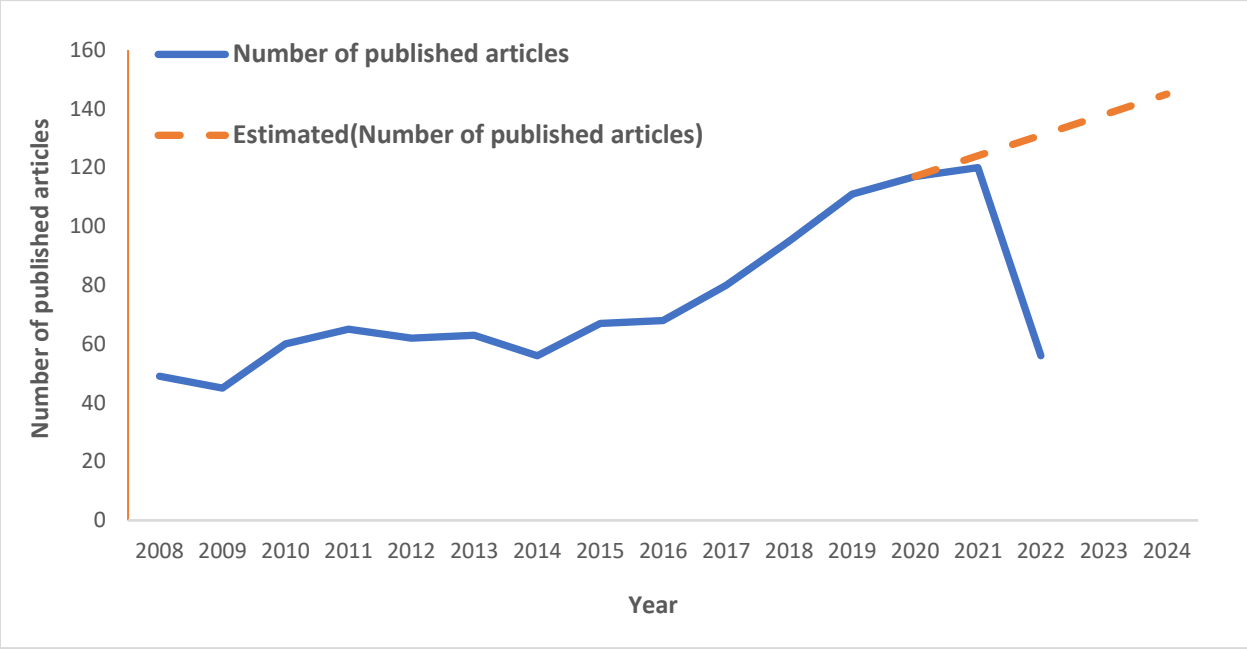


Fig. 2. Annual publication trends from 2008 to 2022 (At the end of June 2022). Source: Authors own work

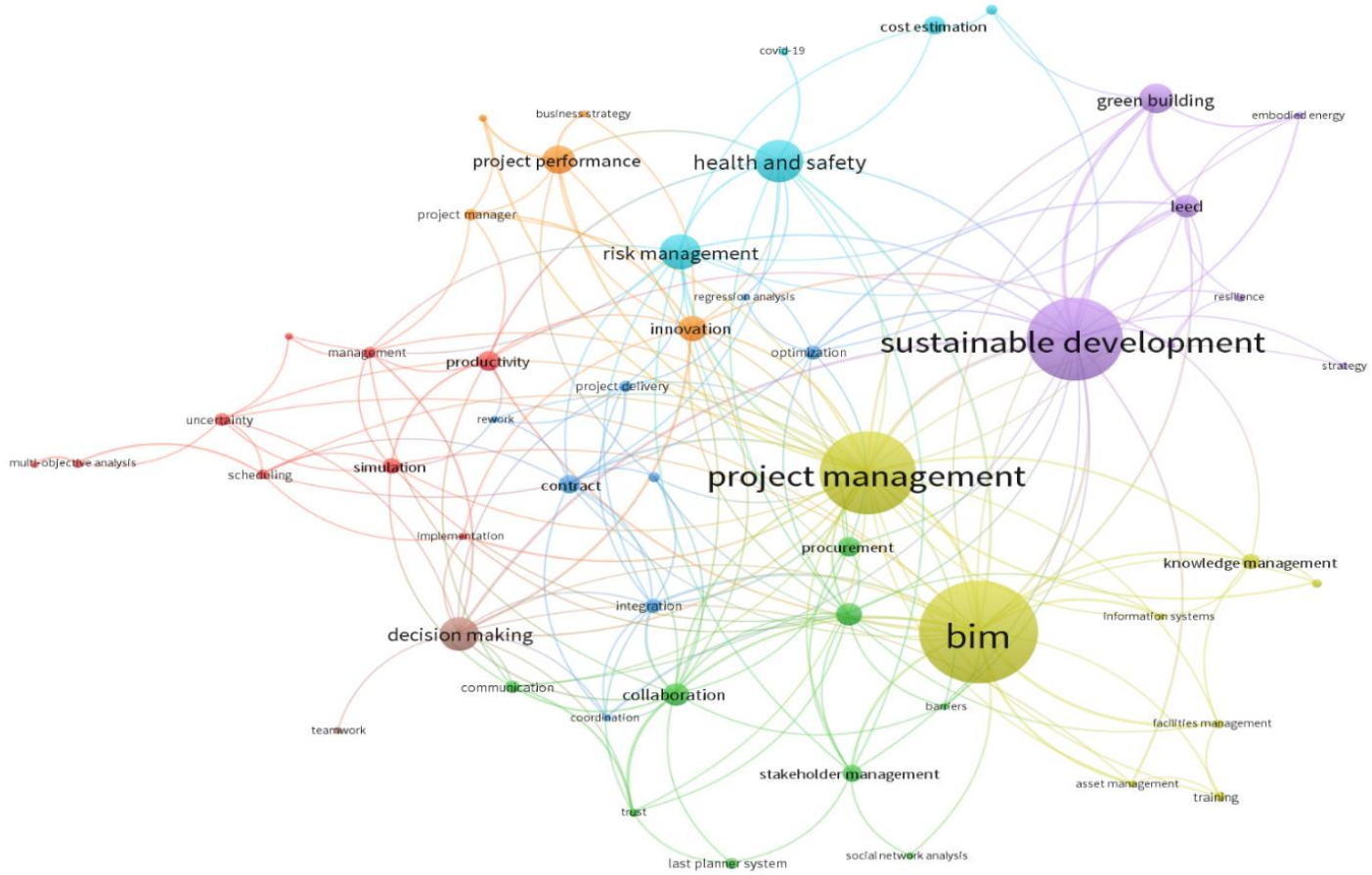
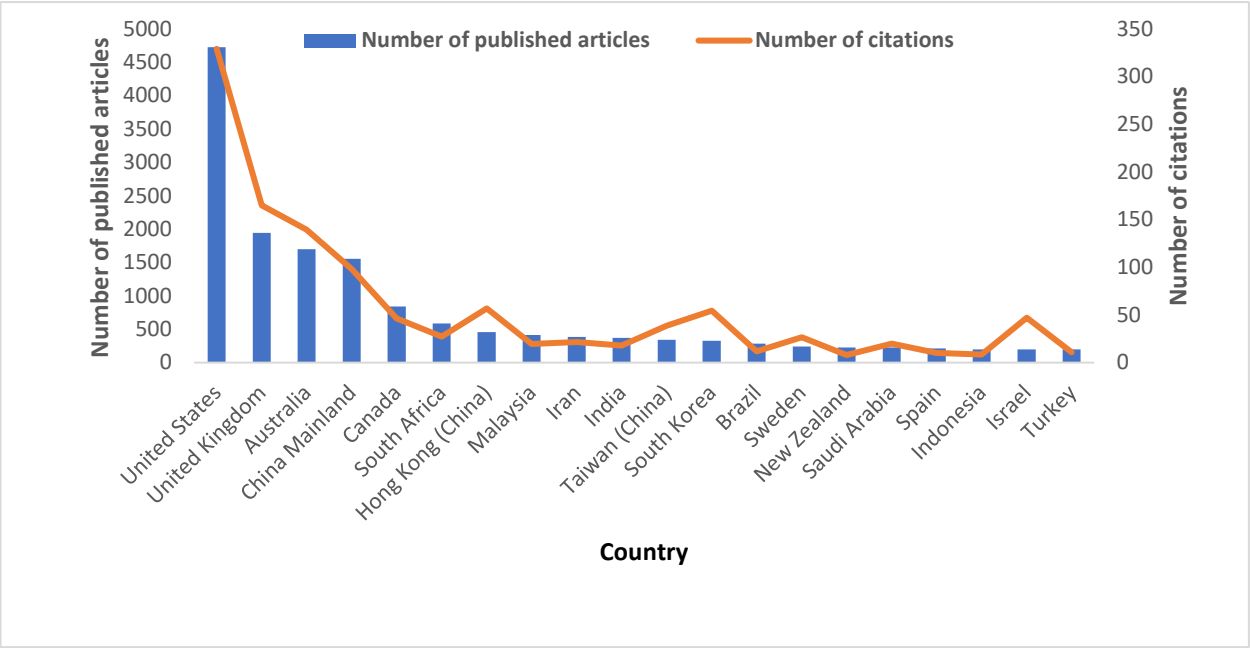


Fig. 3. Network of co-occurring keywords related organization leadership (OL) and employee well-being (EWB) in the construction industry (CI) (2008-2022). Source: Authors own work



676 **Fig. 4.** Top 20 most influential countries/regions on organization leadership (OL) and

677 employee well-being (EWB) in the construction industry (CI). Source: Authors own work

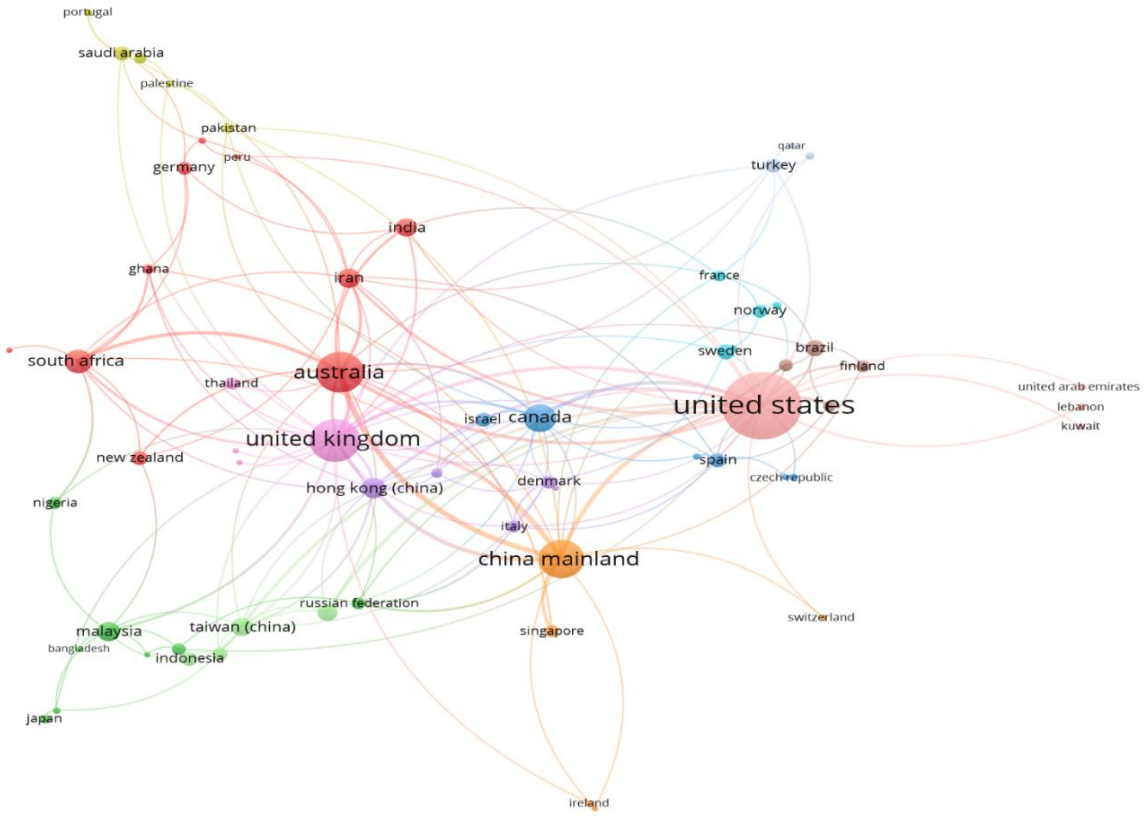


Fig. 5. A network of influential countries/regions studying organization leadership (OL) and employee well-being (EWB) in the construction industry (CI) (2008-2022). Source: Authors own work

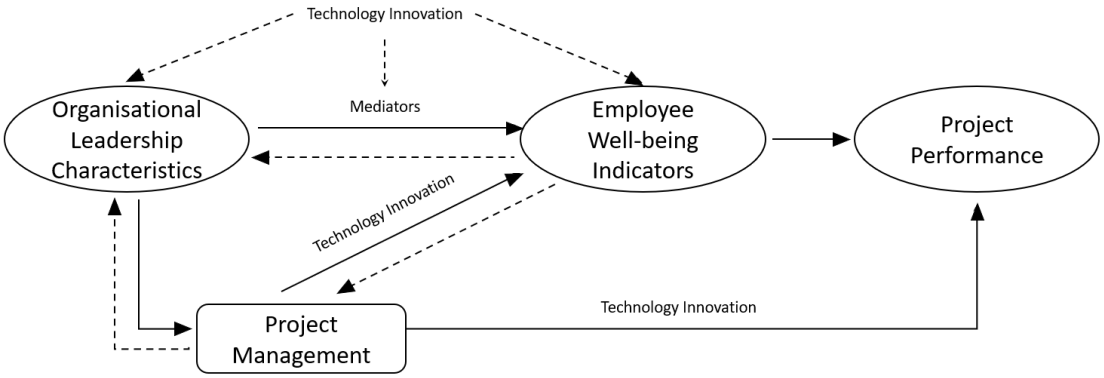


Fig. 6. A theoretical framework for organization leadership (OL) and employee well-being (EWB) in the construction industry (CI). Source: Authors own work

684 **Table 1.** Screening process

Stage	Search string	Results
1	(TITLE-ABS-KEY (leadership) OR TITLE-ABS-KEY (leaders) OR TITLE-ABS-KEY (leader) OR TITLE-ABS-KEY (project AND manager) AND TITLE-ABS-KEY (well-being) OR TITLE-ABS-KEY (wellbeing) OR TITLE-ABS-KEY (welfare) OR TITLE-ABS-KEY (happiness) OR TITLE-ABS-KEY (benefit) OR TITLE-ABS-KEY (benefits) AND TITLE-ABS-KEY (construction) OR TITLE-ABS-KEY (construction project) OR TITLE-ABS-KEY (construction industry))	1,738
2	(LIMIT-TO (SUBJAREA, "ENGI") OR LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "ENVI") OR LIMIT-TO (SUBJAREA, "ECON") OR LIMIT-TO (SUBJAREA, "PSYC")	1,616
3	(LIMIT-TO (PUBYEAR > 2008) AND (LIMIT-TO (PUBYEAR < 2022)	1,362
4	(LIMIT-TO (SRCTYPE, "j") AND (LIMIT-TO (SRCTYPE, "p")	1,213
5	(LIMIT-TO (LANGUAGE, "English")	1,170
6	Manual screening was conducted by reading the abstract and full-text	1,114

Note: Articles were retrieved from Scopus at the end of June 2022
Source: Authors own work

685 **Table 2.** Number of published articles in peer-reviewed journals (Top 15 journals) and conference
686 proceedings (Top 5 conferences)

Journal sources	**Number of relevant articles**	**% Total publications**
Journal of Construction Engineering and Management	52	6.97%
Engineering Construction and Architectural Management	39	5.23%
Journal of Management in Engineering	22	2.95%
Construction Management and Economics	19	2.55%
International Journal of Project Management	17	2.28%
Automation in Construction	15	2.01%
Construction Innovation	15	2.01%
Journal of Engineering Design and Technology	15	2.01%
Sustainability Switzerland	14	1.88%
International Journal of Construction Management	12	1.61%
Built Environment Project and Asset Management	10	1.34%
Journal of Cleaner Production	10	1.34%
Canadian Journal of Civil Engineering	7	0.94%
International Journal of Managing Projects in Business	7	0.94%
Safety Science	7	0.94%
Conference Sources		
Procedia Engineering	11	2.99%
AACE International Transactions	9	2.45%
IOP Conference Series: Materials Science and Engineering	6	1.63%
IOP Conference Series: Earth and Environmental Science	5	1.35%
Matec Web of Conferences	5	1.35%

Source: Authors own work

687 **Table 3.** Co-occurring keywords related to organizational leadership (OL) and employee well-
688 being (EWB) in the construction industry (CI) (2008-2022)

Keywords	Links	Total link strength	Average publication year	Occurrences
BIM	26	54	2018	72
Project management	36	63	2014	58
Sustainable development	20	50	2015	58
Health and safety	13	20	2017	30
Risk management	14	19	2017	25
Decision making	15	23	2015	24
Green building	8	23	2015	21
Project performance	8	13	2015	20
Innovation	12	17	2016	18
Collaboration	16	27	2016	16
Leed	9	26	2016	16
Supply chain management	15	16	2016	16
Procurement	7	7	2014	14
Productivity	9	12	2014	14
Contract	11	14	2015	13
Cost estimation	3	3	2017	13
Stakeholder management	9	11	2017	12
Knowledge management	6	8	2014	11
Simulation	9	10	2012	11
Integration	10	16	2017	10
Optimisation	9	11	2017	10
Communication	7	9	2015	9
Uncertainty	7	7	2018	9
Last planner system	3	3	2014	8
Management	8	9	2013	8
Project delivery	7	8	2017	8
Project manager	6	7	2018	8
Critical success factors	6	6	2018	7
Energy efficiency	3	3	2013	7
Scheduling	7	8	2015	7
Training	4	4	2015	7
Challenges	3	4	2018	6
Covid-19	1	2	2021	6
Facilities management	5	8	2017	6
Multi-objective analysis	3	5	2019	6
Resilience	3	3	2018	6
Trust	7	12	2017	6
Asset management	5	8	2016	5
Barriers	5	5	2019	5
Business strategy	2	3	2015	5
Climate change	5	6	2014	5

Coordination	5	7	2015	5
Differential evolution	1	2	2016	5
Embodied energy	4	6	2017	5
Emotional intelligence	3	6	2016	5
Implementation	5	6	2017	5
Information systems	4	6	2016	5
Monte Carlo simulation	3	3	2018	5
Regression analysis	3	3	2012	5
Rework	5	5	2016	5
Social network analysis	2	2	2019	5
Strategy	2	2	2014	5
Teamwork	1	1	2016	5

Source: Authors own work

689 **Table 4.** Quantitative summary of top 20 documents related to organizational leadership (OL) and employee well-being (EWB) in the construction
690 industry (CI)

Categories	Documents	Titles	Citations	Normalized citations
Category 1: Advanced digital approaches /technologies	Eadie *et al.* (2013)	BIM Implementation throughout the UK Construction Project Lifecycle: An Analysis	393	19.87
	Sacks *et al.* (2010)	Interaction of Lean and Building Information Modeling in Construction	366	15.27
	Lee *et al.* (2015)	BIM Acceptance Model in Construction Organizations	145	7.54
	Oraee *et al.* (2019)	Collaboration Barriers in BIM-Based Construction Networks: A Conceptual Model	67	7.48
	Kaewunruen and Lian (2019)	Digital Twin Aided Sustainability-Based Lifecycle Management for Railway Turnout Systems	66	7.37
	Fisher (2011)	What Practitioners Consider to be the Skills and Behaviours of An Effective People Project Manager	111	6.47
	Aibinu and Al-Lawati (2010)	Using Pls-Sem Technique to Model Construction Organizations' Willingness to Participate In E-Bidding	135	5.63
	Ding et al. (2015)	Key Factors for the BIM Adoption by Architects: A China Study	107	5.56
Category 2: Leadership or employee well-being (EWB)	Olander and Landin (2008)	A Comparative Study of Factors Affecting the External Stakeholder Management Process	119	5.14
	Choudhry *et al.* (2009)	Measuring Safety Climate of a Construction Company	156	5.01
	Toor and Ofori (2008b)	Leadership for Future Construction Industry: Agenda for Authentic Leadership	113	4.88
	Bowen *et al.* (2014)	Occupational Stress and Job Demand, Control and Support Factors Among Construction Project Consultants	74	4.85
Category 3: Specific country/region and a case study methodological research approach	Yu *et al.* (2013)	Lean Transformation in A Modular Building Company: A Case for Implementation	89	4.50
	Touran *et al.* (2011)	Selection of Project Delivery Method in Transit: Drivers and Objectives	76	4.43
	Prasad and Junni (2016)	CEO Transformational and Transactional Leadership and Organizational Innovation: The Moderating Role of Environmental Dynamism	70	4.37

	Wu *et al.* (2016)	How Safety Leadership Works Among Owners, Contractors and Subcontractors in Construction Projects	70	4.37
	Lee and Yu (2016)	Comparative Study of BIM Acceptance Between Korea and The United States	67	4.18
	Amoatey *et al.* (2015)	Analysing Delay Causes and Effects in Ghanaian State Housing Construction Projects	77	4.00
	Alsehaimi *et al.* (2014)	Improving Construction Management Practice with the Last Planner System: A Case Study	59	3.86
	Shahtaheri *et al.* (2017)	Managing Risk in Modular Construction Using Dimensional and Geometric Tolerance Strategies	55	3.62

Source: Authors own work

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692 **Table 5.** Top 20 countries/regions on organizational leadership (OL) and employee well-being
693 (EWB) in the construction industry (CI) (2008-2022)

Country/Region	Documents	Citations	Links	Total link strength
United States of America	331	4702	30	86
Australia	119	1991	18	67
China Mainland	109	1404	16	61
United Kingdom	136	2358	28	59
Hong Kong SAR	32	814	11	29
Canada	59	664	13	25
South Africa	41	392	10	22
Iran	27	306	11	18
Taiwan	24	555	11	16
South Korea	23	776	6	11
Malaysia	29	277	9	11
India	26	257	6	10
Turkey	14	155	7	9
Denmark	12	128	8	9
Italy	10	69	7	9
Saudi Arabia	16	283	7	8
Colombia	9	263	3	8
Russian Federation	11	42	5	8
Singapore	10	265	2	7
Spain	15	147	7	7

Source: Authors own work