FACTORS AFFECTING COMPETITIVENESS IN THE CONSTRUCTION INDUSTRY: A SYSTEMATIC LITERATURE REVIEW

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In today's globalized and highly competitive construction industry, it is crucial for companies to have a deep understanding of competitiveness in order to survive. The competitiveness of the construction industry is influenced by a multitude of factors. As a result, construction organizations must improve their understanding of the relationships between these various factors that affect competitiveness. Thus, this paper aims to determine the factors affecting competitiveness in the construction industry through an analysis of relevant literature focusing on aspects that shape competitiveness in the construction industry. This systematic review explores these factors by analyzing 27 peer-reviewed English-language articles from 2003-2023. It found that the major factors affecting competitiveness are mainly under eight main themes: technological, organizational, human resource, and strategic factors, economic and political factors, financial factors, operational factors, and external factors. The review emphasizes the growing importance of digital technologies in the construction industry's competitiveness and provides guidance for future studies.

Keywords: Competition, Digitalization, Globalization, Innovation, Knowledge.

1 INTRODUCTION

The construction industry significantly impacts economic growth, contributing to both developed and developing countries (Zhang et al. 2023). The competitiveness of this sector is crucial for the success and sustainability of construction firms, influenced by numerous factors (Arai 2021). Understanding these factors is essential for construction companies to compete effectively in the global market. Given the construction industry's dynamic and increasingly competitive landscape, various factors play a crucial role in determining the competitiveness of organizations operating in this sector (Deng et al. 2013). As the sector increasingly embraces technology, it's essential to comprehensively understand the varied elements contributing to competitiveness in this domain.

Over the last two decades, the construction industry has been the focus of numerous studies on competitiveness improvement, attributed to the industry's diversity (Romo et al. 2023). Competitiveness essentially refers to a company’s ability to produce goods and services that meet international market standards and requirements while simultaneously maintaining or enhancing the income of its shareholders (Badawy 2022). Orozco et al. (2014) emphasized that traditional economic theories, which focus on productivity, profitability, or market share, do not fully capture sustained continuous improvement. According to Pellicer et al. (2010) and Giménez et al. (2019),
true competitiveness should not only reflect previous performance but also enable the prediction of potential improvements in future managerial processes. Competitiveness in the construction industry can be improved by considering factors beyond economic indicators, such as performance, potential, and process (Lu et al. 2013, Mohamad and Mat Zin 2019). This paper analyzes relevant literature to determine the factors that shape competitiveness in this sector.

2 METHODOLOGY

This study uses a Systematic Literature Review (SLR) that follows PRISMA guidelines for reliable and unbiased analysis, enhancing credibility and applicability (Pollock and Berge 2018).

At the initial stage, a search string was created to find academic materials related to "competitiveness in the construction industry". To enhance the specificity and relevance of the search, VOS viewer software was employed, as shown in Fig. 1, to visualize keywords from an initial exploratory in Scopus database search using the terms "construction" and "competitiveness or competitive advantage. This visualization aided in the refinement of the search string, ensuring a more targeted and effective literature retrieval process. The research process, along with the software used at each stage, is presented in Fig. 2. Consequently, the ensuing syntax was formulated and utilized to retrieve the pertinent publications: ("Construction industry" OR "construction sector*" OR "construction organi*" OR "construction firm*" OR "construction compan*" OR "construction enterprise*" OR "construction project*" OR "construction contract*" OR "construction management") AND Competit* AND (Factor* OR affect* OR impact* OR determine* OR influnc*).

Fig. 1. Identification of keywords using VOS viewer software.

The search was carried out on the 23rd of August 2023. 1945 articles were found, excluding non-English papers. Only peer-reviewed journal articles with available full texts published between 2003 and 2023 were considered. After screening the paper titles with the search term "construction industry" and keywords related to competitiveness, 97 relevant results were found, while 1848 publications were deemed irrelevant. Subsequent abstract content screened, abstracts that discussed the construction industry and its competitiveness or factors influencing competitiveness were prioritized for inclusion, and it returned with 42 relevant articles, while 55 were found irrelevant. 27 relevant articles were selected after a thorough full-text review of the shortlisted articles. These articles formed the basis of the analysis, as detailed in Fig. 3 and Fig. 4.
Fig. 2. Research overview.

Fig. 3. Systematic literature review process.

Fig. 4. Factors affecting competitiveness in the construction industry.
3 RESULTS

Of the 27 included studies, it found that the major factors affecting competitiveness are mainly under eight main themes: technological, human resource, strategic, organizational, financial, external, economic, political, and operational factors. The categorization of the factors is meticulously grounded in an analysis of their frequency across various studies. These factors are grouped based on the regularity of their mention in the literature.

Out of the selected articles, technological factors were the most researched topic with 15 publications. Human resources factors had 12 articles and strategic factors had 8 articles. Technological factors lead discussions due to their increasing representation over time (Table 1).

Table 1. Detailed list of number of publications by year and publication focus.

<table>
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<tr>
<th>Year</th>
<th>Technological factors</th>
<th>Human resources factors</th>
<th>Strategic factors</th>
<th>External factors</th>
<th>Organizational factors</th>
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Fig. 5 shows the distribution of studies across 13 regions, highlighting global interest in the subject. Indonesia leads with 4 studies, China, South Africa and EU with 3 each. Chile has 2 studies; Pakistan, Jordan, Egypt, Korea, Johannesburg, Hong Kong, Malaysia, and Japan each have 1. This shows the subject’s wide relevance and impact across different regions.

Furthermore, many contexts were analyzed for competitive factors in the construction industry. "Construction companies" were the most studied, with 11 articles, followed by the "construction industry" in 6 studies. "Construction projects" and "Construction organizations" received focus in 3 studies each, "construction firms" in 2, while "construction businesses" and "contractors’ top managers" each had one. However, none examined competitiveness in construction industry sub-sectors, indicating a research gap.

![Fig. 5. Number of publications by region.](image-url)
4 DISCUSSIONS
The review highlights technological factors as central to the construction industry's competitiveness. Technological advancements and innovation are pivotal for operational efficiency and addressing specific challenges, providing flexibility for firms to adapt to market changes (Lee and Park 2022, Oyewobi et al. 2019). Tools like BIM are revolutionizing the industry, significantly improving productivity (Afraz et al. 2021, Tan et al. 2012). Following technological factors, human resources emerge as the second most significant factor. The fusion of technology with the knowledge and skills of a workforce forms a dynamic competitive structure (Taufik 2023, Huda 2018). Lastly, strategic factors signify the importance of aligning organizational goals with market dynamics and technological capabilities which help firms navigate challenges and adapt to market changes (Alkhateeb et al. 2021, Oyewobi et al. 2016).

Regionally, studies indicate diverse global interest with Indonesia, China, and South Africa leading. The geographical distribution highlights different regional priorities and challenges in industry competitiveness. Focusing mainly on "construction companies" suggests a sector-specific approach but misses sub-sector nuances. This lack of sub-sector focus and uneven geographical emphasis reveals a critical research gap. Addressing these would enhance understanding of competitive dynamics in the construction industry.

5 CONCLUSION
This systematic review revealed the major factors affecting competitiveness in the construction industry. This includes technological, human resource, strategic, organizational, financial, external, economic, political, and operational factors. Among these factors, technological, human resource and strategic factors stand out as the top three. Technological integration emerges as a core for enhancing competitiveness, signifying a shift towards a technology-driven future, highlighting the importance of innovative technologies for sustainable growth and leadership. Moreover, the strong correlation between technology, human resources, and strategic planning shows a significant research gap, indicating the need for more study on how these factors collectively influence competitiveness. The review also notes regional and context-specific variations in the construction industry but lacks focus on sub-sectors, highlighting a gap in understanding competitiveness nuances in these specific sectors of the construction industry.

6 REFERENCES


