



A Scoping Review of Literature Review Practices in Construction and Project Management Research

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ABSTRACT

The article investigates the literature review methods and topics that have been applied in construction and project management research. It aims to assess the quality and scope of the existing review articles and to identify the gaps and opportunities for future research in this field. The article uses a scoping review and descriptive analysis to examine the literature review articles published in the last 20 years in academic journals related to construction and project management. It reveals that most review articles adopt a narrative and non-systematic method, which may affect the validity and reliability of the reviews. It also shows that some review methods, such as meta-synthesis and scoping review, are rarely used in this field, despite their potential benefits for synthesizing and analyzing complex and diverse evidence. Furthermore, the article highlights some important areas that have been overlooked by reviewers, such as R&D, project resource management, and artificial intelligence. These areas are essential for enhancing the sustainability and efficiency of the construction and project management trades, as they can offer innovative solutions and insights for addressing the challenges and opportunities in this field. The article suggests that more attention should be given to these areas and to the use of systematic and rigorous review methods in construction and project management research. The article also provides some recommendations for improving the quality and scope of literature reviews in this field.

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1. Introduction

Previous studies often influence researchers' ideas, even unknowingly. Every research depends on hypotheses and axioms from previous studies. They can be accepted, disputed, or used as background to show the reader the research progress. Before doing research, every researcher must review the prior literature to improve their knowledge in the field, coordinate their research with relevant studies based on what they learn, and advance it with existing research achievements. If the researcher ignores basic research and prior studies, the results may be flawed and misleading. The researcher might discover that their work is not original. No one likes to do something that has been done before. Each researcher should read and evaluate other researchers' publications and reports to inform others of the latest findings in their field and how they relate to their work. Reading and evaluating published articles and reports on a topic is essential for validating the research direction. Before starting a research project, each researcher should evaluate the research history and findings on their topic in a literature review, also known as research background.

Significant progress has been observed during the past years in the quality and accuracy of construction and project management studies. Hall [1] had pointed to the growth of research during the 15 years before 2012 and attributed the continuous increase in the number of articles published in this field to the diversity of research fields and methods. The studies on construction and project management have created many disciplines in this field. Many early researchers established the academic foundations of construction and project management in integrated but separate disciplines such as construction, engineering, and management science. Construction and project management as a field is rich in literature, which has expanded from the initial determinism to a progressive path of development that widened existing fields and created new ones with the help of paradigmatic, thematic, and methodological diversity [2]. In the 1970s, executive construction and project management experts determined the research methodology and style [3-5]. In this decade, according to researchers [6], the prominent features of a large portion of research in construction and project management are limited in terms of research scope.

Moreover, most construction and project management research lack accuracy because on-site projects are seldom conducted based on proper research methods. In addition, they often used separate case studies. While providing practical guidance to researchers, research experiences on a construction site are usually difficult to apply to the broader purposes of theory development. The seventies construction and project management research seldom referred to research journals featuring articles dedicated to solving the problems of that decade, and the reports published could have benefited from more citations. In the 1980s, under the influence of professional associations, such as the Project Management Institute (PMI), the International Project Management Association (IPMA), the Association of Project Management (APM), and the Australian Institute of Project Management (AIPM), the research process changed significantly. In this decade, there was a coordinated pressure and demand on these associations to establish a project management knowledge base through their "knowledge body," which creates different types of knowledge bases for this science.

Research conducted by Turner et al. [5] in three major and reputable construction and project management journals [4, 5] shows [4]. Since the early 1990s, significant progress has been made to improve the quality and accuracy of research in the field of project management. Moreover, the wide range of topics relating to construction and project management covers a richer and more diverse field that includes a wider range of methods for research success in this science. Turner et al. [4, 5] also found that more accurate methodologies can also help advance theories in project management [7]. Most importantly, the articles cited by many reputable journals indicate that construction and project management research has impacted a wide range outside its field. Thus, the relevance of the construction and project management field is evident and undeniable in many scientific fields [7]. Therefore, construction and project management studies are published in many journals and with various research methods.

Review articles in construction project management are increasing, but still low compared to other fields. Without rich and integrated support from the literature, the research articles may be diverse and scattered in different media. The review methods, the most reviewed areas, and the least reviewed areas in the construction and project management domain published by reputable scientific databases like Web of Science are unclear. Therefore, it is essential to organize the existing studies significantly and purposefully. The literature gaps can provide the contexts for future research. Literature reviews are important to achieve a theoretical framework of research or problem-solving based on the problems. Reviewing, summarizing, and classifying existing review studies in the construction project management can provide several benefits, such as¹[8-10]:

- Providing a comprehensive overview of the current state of the art and the gaps in the literature on a specific topic or field.
- Identifying the trends, challenges, opportunities and best practices for construction management research and practice.
- Offering a critical analysis and evaluation of the existing methods, models, frameworks and tools for construction management.
- Proposing new directions, recommendations and suggestions for future research and development.
- Identifying dominant and neglected literature review methods,
- Giving a clear and comprehensive overview of available evidence on a topic,

Thus, this study aims to identify and evaluate literature review techniques in the construction project management area as well as the studied and overlooked areas in published review articles relevant to this area of study.

To achieve the goals of this research, the authors first evaluated the position of review studies in knowledge development. Then, review articles were selected in various construction and project management fields from published selected databases and journals (based on what is described in Section 3.1 of the second step). The articles and available data were analyzed statistically and quantitatively using the systematic scoping review. In other words, the authors clarified the generalities of related studies and avoided misleading claims and incorrect information when entering information on relevant research. Finally, the authors have addressed the typology of the reviewed research and the dispersion of various review studies in construction and project management.

1. Theoretical Foundations of Research

2-1 What is review research?

Studying and evaluating the published articles and reports on a specific scientific subject is an important part of a research path. Collecting information about previous studies is called a literature review. Evaluating previous literature often leads to developing new methods and theories to improve the research process [11]. A literature review is a critical summary of most scientific publications about the selected subject. It includes both general and critical evaluations of available studies and articles in a specific area and analyzes related subjects while addressing any information gaps the articles may present. Once a research-related information gap is identified, a path is opened for potential new research. The first step in identifying an information gap is collecting and studying as many related research articles as possible and evaluating them. However, because of the large number of articles covering almost every field of research, identifying a research gap in a specific field can be difficult or even impossible [12]. Review research is known both as independent research and as a part of genuine research. Evaluating the conducted studies shows what has been done in the past, and with this view, the researcher begins their research relying on past studies. In the past years, most of the top journals were not publishing review

¹ <mailto:https://www.elsevier.com/connect/authors-update/why-systematic-reviews-matter>

articles because they were not considered genuine research. Still, recently the trend has changed as the importance of review papers continues to gain recognition.

In this study, the countries citing review articles were categorized into four groups: low-income countries, low-middle-income countries, high-middle-income countries, and high-income countries. The average number of citations for review articles in journals representing developed countries was 6.01, and for low- and middle-income countries, the average number was 3. Developed countries, including the United States, China, Britain, Australia, Canada, Netherland, Scotland, Italy, New Zealand, and Germany, published 88% of the review articles. Among these countries, Britain had the highest number of publications and citations [13]. Investigations show that review articles are used and cited even more than other types of scientific articles [14]. Generally, nowadays, in different fields, review studies have more growth than other types of scientific articles. For example, a study published in 2018 shows growth in review studies that was almost three times the number of review articles published in the United States from 1995 to 2015. The number of review articles published in China more than doubled in the same period [15].

In general, knowing the status of review articles globally will lead to planning for more investment in these studies and focus on internal and external collaborations. While providing an appropriate context for knowledge management, writing review articles helps stabilize and spread the findings. The following classifications of reviewed research in construction and project management are briefly categorized to achieve one of this paper's research goals.

2-2 Various types of literature review and methods of review

Various methods have been introduced for reviewing research by different sources. Generally, researchers have summarized the entire review process in several steps. For example, Tran field [16] describes the review process in three steps: searching, selecting, and coding the literature. Biolchini et al. [17] provide three general steps to develop a review plan: conducting a review, evaluating, and reporting a review. In other cases, each of these steps is divided into more detailed sections. The review process in various studies includes four steps [18], five steps [19], six steps [20], or even 15 steps [21]. The common feature of all of these methods is the order and adherence to defined rules, leading to a report and a summary of the review.

In addition to the diversity of the review steps, various types of review research have been introduced in different sources. The reason for this diversity can be an assortment of patterns, applications, approaches, and methods. Various types of methods designed to help define and conduct literature reviews have been categorized differently. Some researchers have categorized literature review methods in terms of research method, and others have categorized them based on the review purpose and content. In general, researchers such as Pettricrew [22] have categorized various types of literature review according to the methodology and divided them into two "systematic" and "non-systematic" groups. Several researchers, such as Riaz [23], as well as a significant number of reputable medical journals and blogs such as the Meta-Evidence blog, have introduced the "meta-analysis review" or "meta-analysis" as a third independent method. Some others, including Lee [24] and Pai [25], believe that meta-analysis is a subset of systematic methods. In addition to categorizing review research based on methodology, more detailed categorizations divide this research based on the research content and purpose. For example, the studies conducted by Grant and Booth [26] in 2009 divided the review research into 14 groups based on their content. While describing the purpose and differences in these 14 methods, Grant and Booth [26] compared them to search for resources, evaluate them, and combine and analyze them. Accordingly, their classification uses a simple analytic framework called Search, Appraisal, Synthesis, and Analysis (SALSA) to compare and classify the main types of review [26].

In other studies conducted by Xiao and Watson [11], 16 review methods are classified differently from Grant and Booth [26]. In the studies conducted by Xiao and Watson [11], review articles are classified based on the review purpose in four main categories of descriptive, experimental, developmental, and

critical research, using the systematic review method. After that, various types of reviews that correspond to the generalities of these four groups in terms of goals are included in this general classification. In this classification, descriptive reviews include five groups of reviews with narrative titles, synthesis of narrative, meta-narrative, scope, and meta-summary texts. Developmental reviews include seven review categories: meta-cognitive, theme synthesis, meta-interpretation, meta-study, critical interpretative synthesis, and synthetic framework. Finally, the experimental review is divided into four subgroups: the meta-analysis, Bayesian meta-analysis, realistic review, and ecological triangulation. No subgroup has been introduced for critical review. Xiao has introduced a study reference for each method, which leads to a more detailed study and a summary of the research conducted by that method. The main feature of Xiao's classification is that it divides the articles into four groups based on their purpose and helps distinguish the differences between the various methods.

The introduced classifications are relatively new and complete. However, as seen from their comparison, disagreements can arise in recognizing and determining examples and classification. Moreover, some literature review methods are not listed in any of the above classifications. Since the classification of Xiao and Watson [11] and Grant and Booth [26] was closer to the goals of this study, which is comprehensive coverage of review methods in construction and project management, the basis for classifying various types of review research in this paper is an adaptation of the classification criteria of these two studies. Table 1 shows this issue briefly.

In the following section, the authors will describe the research methodology of this study, which is scoping review method.

2. Research Methodology

The purpose of this study is to find out the areas that have been covered and ignored in review articles in the field of construction and project management and to assess the tools used for literature review in review articles of construction and project management. These goals have not been addressed before, despite their relevance. First, the status of review studies in the field of construction and project management was measured quantitatively and statistically. Since the emergence of misleading claims and misinformation in research, researchers have been doing general studies related to possible misleading claims and misinformation for transparency. Therefore, to address the issue of review research and determine the needs of the construction and project management field in this regard, it was necessary to obtain a comprehensive picture of the conducted studies and their achievements regarding review research in construction and project management. Due to such research's absence, the authors have used a scoping review to provide a good preliminary evaluation of the potential volume and available scope of each paper's aim in the research literature. It is appropriate to achieve the goals of this study. Arskey and O'Malley [27] determined a scoping review framework according to four main reasons for conducting it, which are still the reference for many purposeful reviews. These four reasons are [27]:

1. Determining the extent, scope, and nature of research activities
2. Determining the value of conducting a systematic review
3. Summarizing and publishing the results of conducted studies
4. Determining the research gap in the existing literature on a specific subject

The scoping review includes many features of the systematic review. For this reason, it can be considered as a subset of systematic methods [28]. However, unlike other systematic review methods, scoping review studies don't evaluate the quality of texts, synthesize them, add findings, or increase the power or generalizability of the findings. A scoping review seeks to identify the nature and extent of research evidence. This review is particularly appropriate for complex issues or subjects that have not been thoroughly reviewed before. In addition, such studies are cost-effective in terms of both time and cost [29].

3-1 Steps of the scoping review method

According to O'Malley's methodology framework [27], there is a five-step approach in the scoping review method, presented in Figure 1. However, there is a sixth step called "Optional consultation with experts on the findings" in the scoping review method, but it is not considered the main step, and the researcher can delete it [30]. Figure 1 shows the steps of the method in this research.

The details of each of the five steps of scoping review in this research follows:

Step one: Developing the research question

At first, a question relevant to the study's goals was developed to identify the research question in this paper as below:

- What are the main findings of review studies in construction and project management?

This main research question can answer the following topics as well:

- Review research methodology and their frequencies
- Covered and overlooked areas
- Suggestions for future studies

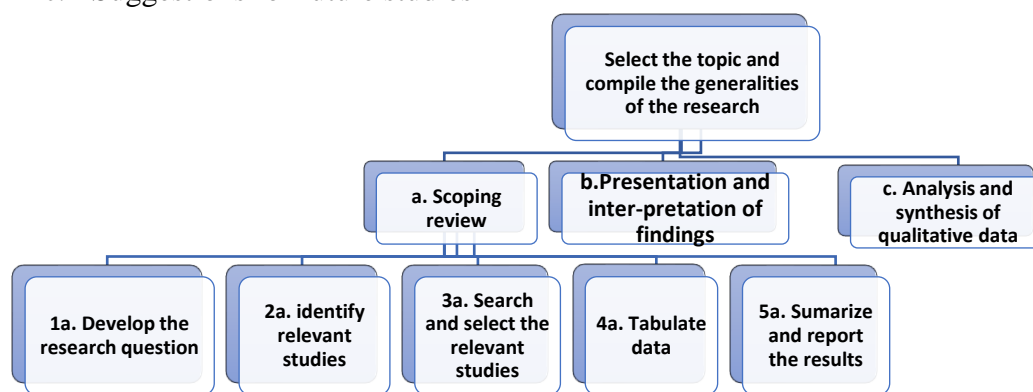


Figure 1. Steps of research method

Step two: Identifying the relevant studies

In this step, a systematic search was conducted on the articles published in the desired scientific journals. The authors first searched the terms *project*, *construction*, *management*, and *infrastructure* in the list of journal names (not among their published articles) available in the Journal Citation Reports™ (JCR). Out of over 12,000 journals listed in JCR2019, only ten journals had those four keywords mentioned in their title. Thus, these ten journals related to the field of construction and project management were selected (see Table 1). Then, two keywords, *literature* and *review*, were searched inside the selected journals (among their published articles) from their first volume until 2020. In the first phase of the search, a total of 609 articles were found. By investigating the titles of the items found, 353 of the findings were book reviews. They were removed from the list because they did not focus on the research and review from other articles. They were book reviews; thus, 256 articles remained. A complementing search in the second phase was conducted to cover all review methods provided in Table 1 and avoid missing any item. In this new search, review types from Table A1 (from the appendix) were searched individually as keywords within the chosen journal without being accompanied by the previous two keywords ("*literature*" and "*review*"). Eight articles with the keywords "*meta-analysis*" and "*meta-study*" were found in the selected journals. Accordingly, the authors were almost certain that the review articles in these ten journals were adequately searched. Finally, these review articles were evaluated and screened according to the criteria defined in the next step.

Step three: Search and select the relevant studies

In the continuation of the search process, it should be determined whether the found articles are relevant to the research questions. The selected set of articles was reviewed to achieve this goal, and some of them were removed. The deletion reasons and criteria are defined as follows. In this study, the following article groups were removed from the search results.

- non-English articles,

- those with conceptual context (the articles that, despite having the desired keywords, had introduced a concept and didn't have a review nature),
- original research (the articles that, despite having the desired keywords, had a research nature and had evaluated the techniques and technologies in the projects in the typical research-focused manner, but were not literature review articles),
- those having irrelevant and non-management context, or
- book reviews, notes, summaries, etc.

Considering these criteria, evaluating their accuracy, and studying the abstract of each article, 77 articles with conceptual or original research context or those with a non-management context were deleted. Finally, 181 articles (sample size) remained to be used in the next step of implementing this method. The number of identified and removed review articles in the selected journals is provided in Table 1. Although the “Journal of Civil Engineering and Management” (the last row of Table 1) matched the search criteria and was selected initially, no review articles were found to be published in that journal.

Step four: Tabulating data

In this paper, to better transfer the content, the authors have used figures or tables. When there is a need for more explanation, it is provided. Table 2 presents various sources where the components and frequencies relevant to each column of this table are described in detail as follows:

Table 1. The number of review articles identified and removed at each stage

Journal names	Search result in the first step with keywords (Literature) OR (Review)	Number of articles of non-review or non-managerial nature	Number of Book reviews	Number of articles from the supplemental search	Number of articles with review nature of the main search	Total number of review articles from the search
	$A=B+C+E$	B	C	D	$E=A-(B+C)$	$F=D+E$
<i>Impact Assessment and Project Appraisal</i>	47	17	20	1	9	10
<i>Journal of Management in Engineering</i>	65	3	41	0	21	21
<i>International Journal of Managing Projects in Business</i>	18	5	2	0	11	11
<i>International Journal of Project Management</i>	82	24	22	4	32	36
<i>Project Management Journal</i>	298	13	267	0	18	18
<i>Journal of Infrastructure Systems</i>	8	2	0	0	6	6
<i>Automation in construction</i>	51	8	1	0	42	42
<i>Journal of construction engineering and management</i>	7	0	0	2	7	9
<i>Engineering, Construction and Architectural Management</i>	33	5	0	1	27	28
<i>Journal of Civil Engineering and Management</i>	0	0	0	0	0	0
Total	609	77	353	8	173	181

Table 2- A sample of a summary of selected sources studied

No,	Author	Year	Title	Journal	Reference	Subject	Thematic classification	Type of literature review
1	P. Littau, N. J.	2010	25 Years of Stakeholder Theory in Project Management Literature (1984-2009)	Project Management Journal	[31]	Stakeholder management	Project and program management	Meta-analysis/ Bayesian meta-analysis

Step five: Summarize and report the results

In the fifth step, the results of 181 selected review articles based on the *year, journal, and type of review, thematic classification, and subject* were summarized and reported.

To address the research questions and determine the needs of the project management field, it was necessary first to obtain a comprehensive picture of the conducted studies and their achievements on review research in construction and project management. In this study, information such as records of conducted studies, the main subject of research, research methodology, research findings, etc., have been collected and analyzed to provide a comprehensive picture of review research and its position in construction and project management. Qualitative and quantitative analyses have been used to analyze the study features. Accordingly, the outputs of the fifth step were evaluated as the research findings.

3. Research Findings

3.1 Analysis of construction and project management review articles according to the year of publication:

Figure 3 shows the publication of review articles in construction and project management starting in 1987. Figure 3 also shows review articles published in the last five years account for 64% of all available articles. This amount is almost 1.6 times the review articles' growth in the last five years compared to previous years in construction project management. However, this issue indicates the increasing significance of these articles and the importance of understanding their impact on knowledge growth. In addition, top journals in construction project management were not publishing review articles in the past years because they did not consider them as original research. These citations mean an increase in the influence index of journals (an index that many authors consider as the basis for selecting a journal). Therefore, the publishing of review articles is more welcomed by journals than in past years.

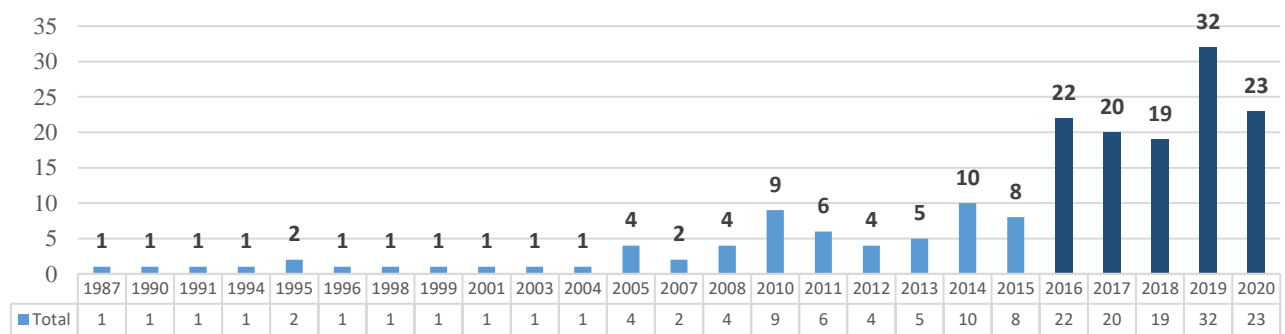


Figure 2. The time distribution of review articles on construction and project management

3.2 Analysis of construction and project management review articles according to journals:

The results of analyzing 181 articles in 10 reputable construction and project management journals in the Journal Citation Reports™ (JCR) from 1987 to 2020 indicate that over the 33 past years, “*Automation in Construction*” had the highest publications of these articles with 42 published review articles, which is equivalent to 23% of the review articles relevant to this research. The second highest publication rate went to the “*International Journal of Project Management (IJPM)*,” (one of the selected journals for this research). It was the first journal to publish a review article in 1987. After publishing 36 review articles, 19.8% of the review articles published among the selected construction project management journals, IJPM attained second place in publishing review articles. Following that, three journals, *Engineering, Construction, and Architectural Management*, *Journal of Management in Engineering*, and *Project Management Journal*, respectively, have the most share of publishing review articles. These five journals together have published 80% of review articles.

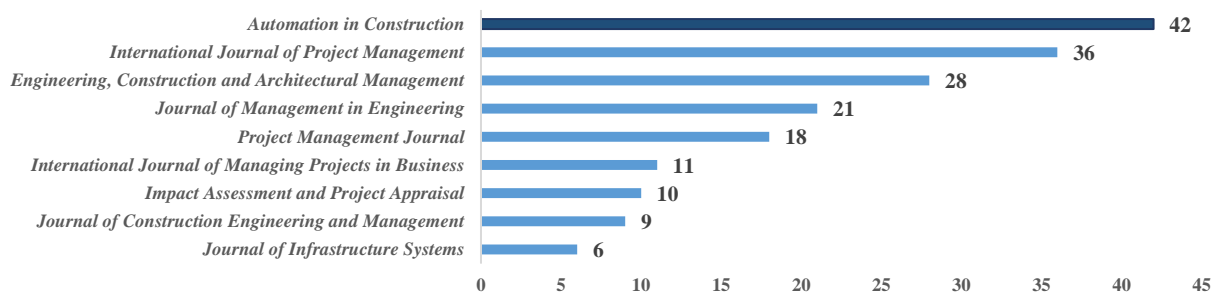


Figure 3. Distribution of review articles published in each journal

4. Analysis of construction and project management review articles according to the type of review:

The status of the articles was analyzed to evaluate the frequency of applying literature review methods based on the explanations presented in Table 1. After conducting a relatively comprehensive examination of construction management articles using the scoping review method, the authors determined that the review articles published in recent years are more systematic than those published in the 90s. Moreover, narrative review articles are being outnumbered by systematic review articles. About 70% of the review methods in the evaluated review articles were allocated to the systematic method. Some methods such as systematic review and narrative review have been very popular in construction project management and have been used in many complementary fields. However, the application of some methods is very specific, and they can be found in some non-construction management fields such as medicine. Thus, they do not apply to this research focus on construction project management. It should be noted that almost 31% of the introduced review methods cover 100% of the review articles on construction project management. In practice, 59% of the existing review methods had no application in the selected articles of project management construction. Despite their applicability and appropriate capabilities in this field, it is important to note the lack of articles in construction project management using some methods that could possibly offer a more thorough overview. These valuable but overlooked methods include meta-analysis, umbrella review, and scoping review. One of the important reasons for not using the existing methods is the lack of most researchers' familiarity with different review methods. An overview of research method books, both in the humanities and construction project management, shows that few sources have comprehensively addressed the meta-analysis, umbrella review, and scoping review methods. This unfamiliarity may cause many original studies to be ignored because stakeholders do not have time to study them. Since many review methods can summarize the results or interpret multiple studies, identifying the best research method for all types of studies can be very useful.

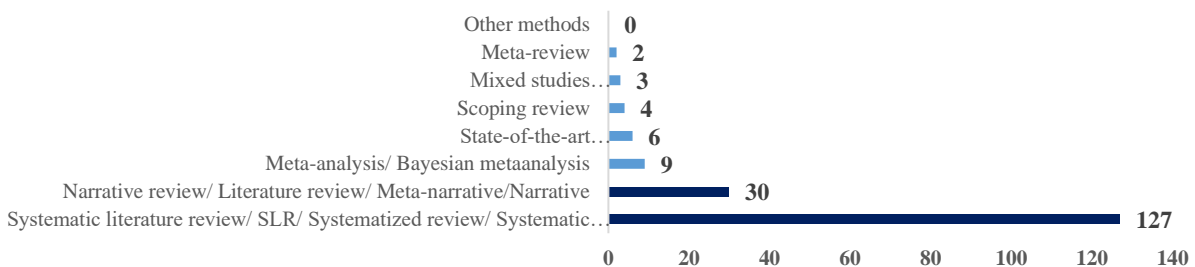


Figure 4. Types of review (See Appendix A)

5. Analysis of construction and project management review articles according to thematic classification:

The following figure classifies the studies in this field to determine the field of study of review articles published in construction and project management. After evaluating the existing thematic classifications, the authors of this paper adopted the classifications used by Carden and Egan [7] and Pietroforte and

Aboulezz [32] and Jadidoleslami [33, 34]. We selected several subjects and categorized them into six main groups and one integrated group, each of which includes defined subsets specific to their studied field. Figure 6 shows the six main categories and the topics they cover.

1. Industry structure and project environment [34]–[47]	Codes, standards, and information systems	4. Financing, outsourcing, contract, and project systems [162]–[174]	Bidding activities and strategies, and tendering practices
	Internal construction methods and issues		Project financing issues
	Structure and performance of domestic industry, economic issues and their effect		Analysis and selection of systems and project delivery contracts
	External construction methods and issues		Public-private partnership
	Research and development trends		Outsourcing
	Role and collaboration in the industry		...
	Industrial relations, union and nonunion construction		
Professional development and training			
...			
2. Management of organization, company, or firm [48]–[59]	Organizational project management office	5. Human resources and behavioral areas [175]–[192]	Team building and teamwork
	Organizational structure		Problem-solving skills
	Project portfolio management		Recruitment and allocation of personnel
	Organizational governance		Personnel evaluation
	Organizational maturity models of project management		Factors affecting human behavior and performance
	Management of firm operations		Leadership and negotiation
	Management of information systems, IT applications		Behavior management
....	...		
3. program and project management [31,60–161]	Project integration management	6. Research in project management and schools of thought [193–205]	Positivist, interpretative, pragmatic, post-modernistic, etc.
	Agile management		The first and second order in project management
	Stakeholder management		Research strategies and methods in project management
	Sustainability management		Artificial intelligence
	Management of change and integration in project		Decision-making techniques
	Virtual construction and design		...
	Management of design, value engineering, pre-design, and design estimations		
Project MIS and IT applications			
...			

Figure 5. Primary categories of construction and project management with applicable citations under each category, including the concepts, tasks, and techniques needed to support each area of research.

These subjects reflect six primary categories covering construction project management science, which are: 1) industry structure and project environment, 2) management of organization, company, or firm, 3) program and project management, 4) financing, outsourcing, contract, and project systems, 5) human resources and behavioral areas, and finally, 6) research in project management and schools of thought. Each of the six primary categories has areas that further define aspects or related tasks that integrate these subjects. Eight out of 181 review articles covered multiple subjects, and 173 articles were published explicitly in one of the six research areas featured in Figure 6. The citation numbers are listed for each category.

A major share of the articles focused on review studies in “program and project management,” with 108 articles making up 59% of the evaluated studies. Following that, studies on “human resources and behavioral areas” and “financing, outsourcing, contract, and project systems” covered about 9% and 7% of the existing review studies, respectively. Generally, study fields such as research in project management and schools of thought (category 6), management of organization, company or firm (category 2), and industry structure and project environment (category 1) or integrated subjects should be studied more. However, it is interesting that more than 50% of the studies conducted in these three areas have been published in the last five years, which indicates the growing need to review studies in these fields and to encourage more attention from researchers. Each of these six groups was divided into sub-groups.

6. Analysis of construction and project management review articles according to the subject: Gephi v0.9.2 software was used to analyze and enrich the display of review studies in reputable journals in construction and project management based on subject, and its output is presented in Figure 6. In this figure, the main nodes are the six research areas introduced in the previous section and outlined in Figure 5. Eight articles [47, 48, 85, 91, 93, 100, 141, 207] with integrated subjects were commonly observed between the areas of program and project management, management of organization, company, or firm, and industry structure and project environment, which are not independently shown in the statistics of the six primary categories. Figure 6 shows the thematic distribution of 173 review articles in 10 selected construction and project management journals listed in the Journal Citation Reports™ (JCR). The nodes and lines show the main and subcategories of each theme. Figure 6 shows that few or no review articles covered the light-colored dots. The node size shows the article frequency in that theme. The biggest node is category 3 of program and project management, which agrees with the previous section that this field has more review articles.

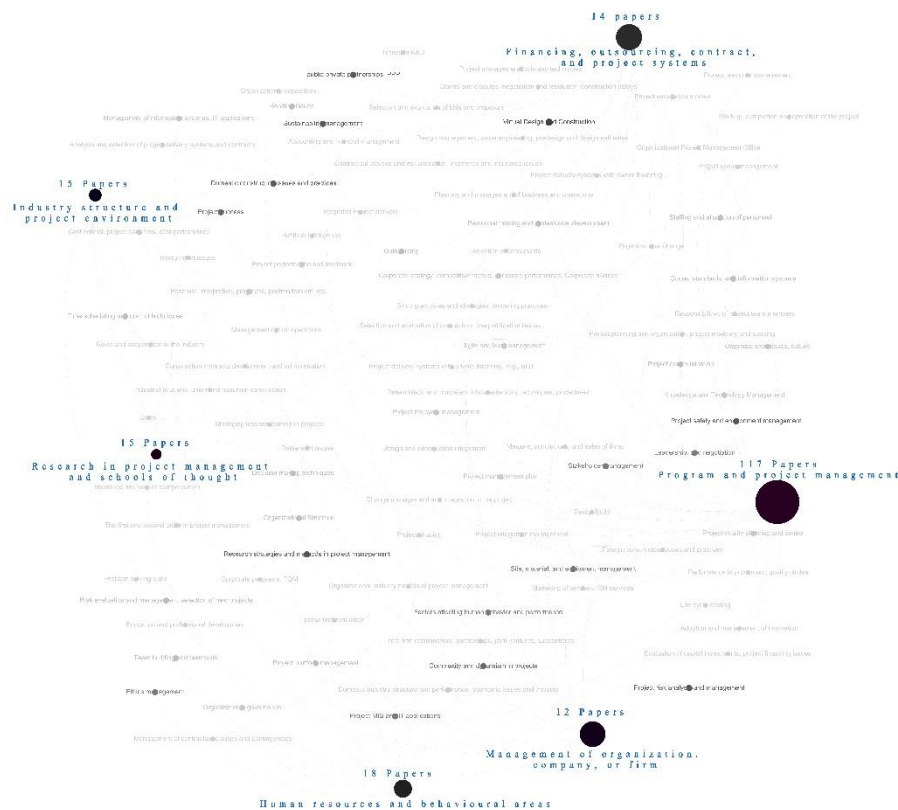


Figure 6. The frequency of construction and project management review articles based on subject. Many parts of Figure 6 are faint and smaller in size, indicating a lack of review articles on that subject in various construction and project management studies and the need to focus on review studies in these overlooked areas. For subcategories such as the trends in R&D, the first and second order in project management [208], artificial intelligence, and project scope management, they have no review article published in the selected journals of this research. Under the category of financing, outsourcing, contract, and project systems, for about three-quarters of the subcategories (i.e., stock, selection of consultants, and bidding activities and strategies, tendering practices), no review articles were found among the chosen journals in this research. Suppose the subcategories that only had one or two articles (i.e., bonding issues, selection and evaluation of contractors, and prequalification issues) were counted as not-covered

topics. In the latter case, the overlooked subjects will be even more ignored if a review study gap occurs. The top 10 subcategories among the primary categories presented in Figure 6 are listed in Table 3.

Table 3. Top 10 Subcategories (Based on Figure 6)

Subcategory	Number of published articles	Percent of published articles
Virtual design and construction	29	15.18%
Project safety and environment management	12	6.28%
Project risk analysis and management	12	6.28%
Research strategies and methods in project management	12	6.28%
Domestic construction issues and practices	11	5.76%
Sustainability management	11	5.76%
Public-private partnerships, PPP	11	5.76%
Project MIS and IT applications	9	4.71%
Stakeholder management	8	4.19%
Site, material, and equipment management	7	3.66%
Total	122	63.87%

As shown in Table 3, Virtual design and construction, as the subcategory to program and project management (category 3), has the greatest number of published review articles, covering about 27% of its main category and 15% of the total number of retrieved review articles in this study. In total, the top ten subcategories account for 63.87% of the 96 subcategories, which is a considerable number.

Perhaps one of the reasons for the volume of more review studies in some categories such as “program and project management (category 3) and more focus on subcategories such as project risk analysis and management or “project safety and environment management (Table 3) is evidence of an industry’s need for direct access to the results of these studies. More notably, most of these articles have been written in the last five years. Since 2015, more than 70% of review articles have focused on the subcategory public-private partnerships (PPP), and about 40% of review articles focus on the subcategory project risk analysis and management. This reveals a continued need to perform research in these areas. In contrast, given the novelty of the study fields in the subcategory, project management information system (MIS) and information technology (IT) have few review articles. This can be due to project construction management’s dependence on IT professionals and computers, which are essential but hidden based on their proficiency. Construction project management teams’ increased use of software to solve difficult problems is obvious, and the software is always mentioned. Still, the algorithms of model simulations are produced by construction computer science-trained researchers who have little involvement with the project management aspect of the industry, company, or services overseen by construction project management.

7. Conclusions

This research has identified and evaluated the review techniques and the overlooked topics of construction project management articles using the scoping review method. The main findings of this research are:

1. The authors found 181 review articles in reputable scientific journals related to construction project management and compared them with other sciences in terms of number and frequency.
2. The authors noted the increasing importance and challenges of review articles in this field, as well as the dominance of the systematic literature review method and the neglect of other methods.
3. The authors suggested that quantitative and measurable statistics and analyses are effective for validating the results of review studies and should be preferred in construction and project management.

4. This research contributes to the existing knowledge on review studies in construction project management by providing a comprehensive overview of the current state, gaps, and trends of this field. It also provides insights and recommendations for future research directions and methods.
5. In addition, this research has categorized the articles based on research positions and described them from a statistical point of view based on the features of review articles.
6. This research can help researchers, practitioners, and policymakers to gain a better understanding of the existing literature, identify the research needs and opportunities, and improve the quality and impact of review studies in construction project management.
7. Future construction and project management reviews should also consider the content production patterns of review articles and identify the potentials for review studies in each field separately. This can provide a complementary insight into the strengths and weaknesses of the articles in the literature.
8. The statistics of the overlooked study fields in writing review articles is another important issue.
9. The literature review priorities in this study included “management of organization, company, or firm” and “research in project management and schools of thought” or “integrated subjects”. These are construction management priorities that need more attention.
10. The disproportionate statistics of studies in some areas, such as “stock” or “selection of consultants,” “claim” or “bidding activities and strategies, which include tendering practices,” is another significant issue. The authors of this paper could not find any comprehensive and high-quality review study on these subjects.

Despite the ever-changing construction and project management industry needs and the rich literature background, the shortage of review studies in the desired fields is noteworthy. Focusing on the overlooked subjects and providing a high-quality literature review in neglected construction and project management research fields will lead to knowledge creation and clarification of these areas.

Insufficient high-quality review studies and a lack of critical studies on some of the raised issues cause immaturity of the literature review. So, the interested researchers should not consider the present study as the endpoint. The scope of this study was limited to all the ten journals containing the four keywords mentioned earlier among more than 12,000 JCR2019 journals. Expanding this scope to other databases (e.g., Scopus and Google Scholar) with a wider range of keywords searched in journal titles, scopes, and descriptions can help discover more review articles (e.g., [33, 209-212]). This scope expansion can be an interesting addition to the current one and a good subject to research in the future.

No journal in construction and project management solely publishes review articles as of the year this article’s publication (2022). Such a journal would help those who want to catch up on research in the area of their choice. However, given the growing trend of review articles in this field, it seems necessary to suggest publishing a specialized journal in this field. Developing networks of construction and project management researchers would also provide a valuable strategy for capacity development and research collaboration.

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Appendix A:

It should be noted that some of these methods, such as mixed studies, mixed reviews, and methods review/borderline review, have different names in the Xiao and Grant's classification are in one classification here despite their similar definitions and content. Moreover, despite being practical, the meta-review method was not mentioned in any of the methods of these two articles and was added to Table A1. Other methods, such as the critical review or overview, are somewhere between systematic and narrative methods. These methods are defined in separate rows. However, when evaluating the statistics in the review articles published in construction and in construction and project management, they were classified in the systematic or narrative group according to their method.

Table A1. The many review types and description

Types of review	Description
<i>Critical review</i>	The author has evaluated and criticized the quality of literature extensively and carefully. It is beyond mere description and involves a degree of conceptual analysis and innovation. Usually, it leads to a hypothesis or model.
<i>Mapping review/ systematic map</i>	Identifying the gaps in the research literature reviews or classifies the literature beyond the initial research.
<i>Qualitative systematic review/qualitative evidence synthesis</i>	It's a method of integration or comparison of findings of qualitative studies. It seeks out the "themes" or "structures" that are in qualitative studies.
<i>Meta-analysis/ Bayesian meta-analysis</i>	A technique that statistically combines the results of qualitative studies to obtain a more accurate effect of the results.
<i>Mixed studies review/mixed methods review/ borderline review</i>	It refers to any combination of methods that include an important literature review component (usually systematic). This method refers to a combination of review approaches.
<i>Rapid review</i>	This is a custom evaluation of a well-known specific subject, using systematic review methods to search and critically evaluate the existing research.
<i>Scoping review</i>	A preliminary evaluation of the size and scope of the existing literature. It aims to identify the nature and extent of research evidence (usually including ongoing research)
<i>State-of-the-art review</i>	Unlike other retrospective approaches, the state-of-the-art review focuses more on contemporary issues. It may offer new perspectives on the subject or provide a basis for further research.
<i>Systematic literature review/ SLR/ Systematized review/ Systematic search and review</i>	The systematic literature review (SLR) systematically searches, evaluates, and synthesizes research evidence and often follows review guidelines. It combines the strengths of a critical review with a comprehensive search process. Usually, it asks broader questions to produce the best combination of evidence.
<i>Umbrella review</i>	The umbrella review particularly refers to the collection of evidence from several reviews of available and usable articles. Focusing on the extensive situation or problem in which interventions exist shows the reviews that address these interventions and their consequences.
<i>Narrative review/ Literature review/ Meta-narrative</i>	In the narrative review, a qualitative method, the focus is on summarizing a subject's original and initial studies. In this type of article, the author or authors ask a question, answer it through a library or documentary search method, search for relevant literature, and integrate the obtained data and conclude their arguments.
<i>Textual narrative synthesis</i>	The textual narrative synthesis often requires studies that belong to or are organized as convergent subgroups, which are compared and have similarities and differences between these studies based on the extracted data. Due to the standard coding format, few studies related to the research question will have the features required for the study.
<i>Meta-summary</i>	The meta-summary includes extracting findings and calculating the impact based on these findings (often known as vote counting).
<i>Realist review</i>	A realist review is usually used to evaluate a policy in practice. It seems appropriate for answering this question: What is useful for whom, under what conditions, and how does it work?
<i>Ecological triangulation</i>	Ecological triangulation is very similar to the realistic review and is applied to answer questions such as: for whom? Under what conditions? and under what circumstances? These questions organize data extraction and information in the study features matrix. Ecological triangulation, as a meta-study, should be considered, including meta-study, meta-theory, and meta-data.
<i>Meta-ethnography</i>	Meta-ethnography has been upgraded from a combined qualitative research method to a literary synthesis method. The meta-ethnography review method has seven main steps: getting started, deciding on the initial point of view, reading the relevant studies, determining the type of relationship between these studies, interpreting and translating the synthesis, and stating the synthesis.
<i>Thematic synthesis</i>	Thematic synthesis is very similar to a meta-ethnography review. In this method, the process of data extraction and synthesis uses theme analysis.

<i>Meta-interpretation</i>	Meta-interpretation seeks a systematic review to complete the synthesis process through an appropriate interpretation while being honest. To achieve this purpose, a research area is selected instead of the question related to the searcher.
<i>Meta-study</i>	Meta-study is a combination of data meta-analysis, meta-synthesis, meta-theory, and meta-method. These steps of meta-study in the research process include developing the research questions, searching, evaluating the initial research data, integrating and publishing the findings.
<i>Critical interpretive synthesis</i>	Critical interpretive synthesis was developed in response to problems in the meta-ethnography method, and instead of using diverse literature, it focuses on different methods. In the critical interpretive synthesis method, data extraction is based on formal or informal articles.
<i>Framework synthesis</i>	The framework composition, sometimes called the “best fit,” includes developing a primary conceptual model of the research question that can be used for coding in the literature. Then, the conceptual model (framework) is modified according to the collected evidence. Therefore, the final product is a modified framework that may include modified and new factors that were not anticipated in the original model.
<i>Overview</i>	The overview may include a comprehensive search (systematic or non-systematic) and a quality evaluation (depends on whether it is systematic or not). Moreover, depending on the method, these will be categorized as “narrative review” or “systematic literature review.”
<i>Meta-review</i>	The features and nature of the meta-review are similar to that of the systematic review. It is a general term that evaluates the background of conventional literature. It can cover a wide range of subjects at various comprehensive levels. It may include research findings.
<i>Critical interpretive synthesis</i>	The critical interpretive synthesis method was developed as a change in the meta-ethnography method and is focused on different methods instead of applying diverse literature. In the critical interpretive synthesis method, data is extracted based on formal or informal articles. In addition, “quality evaluation” is not a main step of the literature review process. Still, each study is judged by different criteria (based on other literature of that kind), and judges consider the theoretical background of research that can influence the evidence. It should be noted that this method edits the whole literature review process through a repetitive, reflective, and exploratory process (and consequently is less formal and standard). However, it performs controls and balances using a research team rather than an individual.