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Megaprojects from the lens of business and management studies: a systematic literature review

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Abstract

Megaprojects serve as the foundation of societal progress, providing essential infrastructure for a country's development and meeting its societal needs. There is a growing interest within the academic community to untangle the complex nature of megaprojects. This study conducts a comprehensive systematic literature review on megaprojects from the perspective of business, management, and accounting studies to provide a general map of the research conducted in this field and to highlight gaps for future research. The findings reveal thematic areas, including (i) sustainable development and decision-making, (ii) governance approach, (iii) project management, (iv) risk assessment, and (v) economic and social effects/social responsibility. Moreover, identified gaps encompass limited consideration of the use/operation and end-of-life phases, inadequate evaluation of environmental and social impacts in economic terms, insufficient focus on sustainability reporting, inclusive governance, and using novel methodologies for complex system analysis in the field of megaprojects.

Keywords

Mega project, Management Studies, Socio-Economic Impacts, Project Management, Bibliometric Analysis, Biblioshiny.

1. Introduction

The term megaproject initially emerged in the 1970s in the United States, it refers to large, expensive, and generally controversial projects (Bearfield & Dubnick, 2009) and extends beyond constructions, to include events such as the Olympic Games (Randeree, 2014) or the Universal EXPO (Shakirova, 2015), urban redevelopment initiatives (Dogan & Stupar, 2017), and international policy projects such as the Belt and Road Initiative (BRI) (Daye et al., 2020) or even aerospace programs such as the Apollo Programs (Horwitch, 1990). Megaprojects represent very complex endeavours (e.g., technical complexity, social and managerial complexity) that are distinguished by their amplitude, cost, lifespan and size of territory impacted, number of stakeholders involved, and long-lasting impacts (Thacker et al., 2019). Notwithstanding their complexity, megaprojects are experiencing the "biggest boom" ever (H. Ma et al., 2020). Flyvbjerg (2014) suggests that this enthusiasm for megaprojects stems from four sublimes, namely technological, aesthetic, political, and economic, motivating practitioners, decision-makers and contractors to invest part of their career in ambitious and unique achievements.

Due to their crucial role in the development of society, megaprojects have long been a subject across various research disciplines. Scholars from fields such as business (Invernizzi et al., 2019; Zhou & Mi, 2017), environmental studies (K. Li et al., 2013; Pu et al., 2023), sociology (Camargo & Vázquez-Maguirre, 2021), and engineering (Geraldi & Davies, 2021; Khahro et al., 2023) have examined megaprojects from different perspectives.

Managing the intrinsic complexity of megaprojects (Nyarirangwe & Babatunde, 2021) and addressing conflicts among stakeholders and local communities are major challenges in today's context. Although megaprojects may generate huge positive changes and impacts, they often face opposition from civil society. For instance, a hydropower project may generate clean renewable energy for decades but also disrupt natural ecosystems and displace local populations, as the Three Gorges Dam demonstrated (K. Li et al., 2013). Similarly, mining projects can create local jobs and stimulate economic growth while causing environmental devastation (Teo & Loosemore, 2010). Due to the uniqueness of each megaproject and the overlapping interests of stakeholders operating on different timespan, geographic levels, and sustainability dimensions, there is no one-size-fit-all solution. Indeed, megaprojects management, to face with the limitations (e.g. delay due to social conflicts) and the open challenges (e.g. multi stakeholder and multilevel governance) emerged from past literature, needs new holistic and complex points of view, and fundamental concepts (e.g., project success, megaprojects' governance, value creation) have to be discussed and re-defined at all levels, as brilliantly highlighted by Ika and Pinto (2022) in terms of project success or by Nuno Gil (2021) in terms of multi-stakeholder governance and value creation. In this sense, business and management studies play a strategic role in addressing these challenges, encompassing stakeholder management (Derakhshan et al., 2019) and the evaluation and reporting of environmental, social, and economic impacts (Lin et al., 2017).

Over the past decades, scholars have conducted literature reviews addressing specific aspects of megaprojects, such as project management (Gupta & Jha, 2023; Rolstadås et al., 2014) and critical success factors (Caldas & Gupta, 2017; Cepeda et al., 2018), project governance (Derakhshan et al., 2019), stakeholder management and collaborative innovation (Chen et al., 2021), trust in megaprojects (Cerić et al., 2021), megaprojects complexity (Nyarirangwe & Babatunde, 2021), and megaprojects' social responsibility (Zhou & Mi, 2017). While these studies have shed light on specific

aspects of megaprojects, the literature in this field is still fragmented and a general map showing the focus and themes of the available research is lacking. Indeed, because of the inherently complex nature of megaproject management, there is a need to specifically approach the topic with a holistic and interdisciplinary point of view, to avoid a siloed and mono-disciplinary approach that has amply demonstrated its limitations in sustainability science in the past.

On this basis, the current study aims to contribute to the existing body of research by addressing the following two research questions: 1) what are the main research themes regarding megaprojects in the business, management, and accounting subject area? and 2) what are the research gaps in the megaprojects domain to be potentially considered in future research by researchers in the field of business, management, and accounting?

The rest of the article is structured as follows. Section 2 presents the research methodology and the steps taken to select and analyse articles in this research. Section 3 presents the results based on the thematic clusters of the selected articles. Based on the research gaps discovered in this literature review, Section 4 presents an agenda for future research by the scientific community in the field of business, management, and accounting, and finally, Section 5 concludes the paper.

2. Methodology, data collection, and research framework

In order to present and analyse the large map of studies on megaprojects from the lens of business, management, and accounting research, a systematic literature review has been conducted in this research. In this regard, three main steps were taken, including (i) retrieving a corpus of the literature and selecting documents to be analysed, (ii) clustering the collected documents based on their keywords co-occurrence, and (iii) analysing the content of each cluster of articles.

In the first step, to enhance the establishment of search boundaries and ensure the inclusion of relevant articles from the target literature on megaprojects research, a search protocol was

developed using the PRISMA statement framework (Liberati et al., 2009). To ensure the quality of systematic reviews, it is crucial to design an appropriate search string, select a reliable database, and establish clear inclusion and exclusion criteria for selecting relevant articles from the target literature (Shams Esfandabadi et al., 2022). In this regard, Scopus is identified as the main database to select relevant articles for its wider coverage compared to other databases (Singh et al., 2021), and the corpus of the literature analysed corresponds to the set of scientific contributions (article, in-proceedings, working papers, book chapters) obtained through the query "*SUBJAREA(busi) TITLE-ABS-KEY(("sustainable infrastructure*" OR "megaproject*" OR "mega project*" OR "mega-project*" OR "mega infrastructure*" OR "major project*") AND (environment* OR social* OR economic* OR sustainab*) AND (impact* OR assess* OR account* OR report* OR output* OR outcome*))*", limited to documents in the English language. Although a sustainable infrastructure might encompass projects of all sizes, as argued in the Envision Framework (Institute for Sustainable Infrastructure, 2018), and therefore does not necessarily represent a megaproject, this term was added to the search string (and screened afterwards) to widen the collected data. Moreover, the choice to include sustainable infrastructure in the search is consistent with current reporting trends of major construction players, which often discuss the sustainability of their infrastructure as associated with large projects, often transnational as well (Gordano et al., 2022) . The query returned a total of 323 documents, including 212 peer-reviewed journal articles and 111 other contributions. Following an initial screening based on titles and abstracts, 53 contributions which were not directly related to impact accounting and megaprojects or large infrastructure were excluded. The remaining subset of articles underwent a thorough analysis by reading the full article texts, resulting in the exclusion of an additional 12 articles either due to irrelevance or the inability to access the full content. Specifically, to address the blurriness between megaprojects and sustainable infrastructure, the authors established specific eligibility criteria. First, small infrastructure projects (e.g. small house

units or family houses) were excluded. Second, contributions related to the Envision Framework and general assessment framework for sustainable infrastructure were included since the Envision framework is currently globally adopted to certify large sustainable infrastructure projects. Third, contributions pertaining to long-term urban and rural planning projects, cities, and large-scale redevelopment policies, mega-events (e.g. Olympic games), or infrastructural territorialization projects (e.g. Russian strategy for the Arctic area) were taken into account. This process led to the selection of 258 documents, which were then used as an input to the document clustering process in the second step.

In the second step, to enhance the content analysis of retrieved documents, a clustering technique was employed using the 'bibliometrix' R package to categorize documents based on their thematic similarities. This R package was selected due to its wide availability of statistical and graphical techniques and its extensibility (Aria & Cuccurullo, 2017). In this regard, the keyword co-occurrence algorithm was used and a topic was selected for each identified cluster thanks to the Louvain clustering algorithm (De Meo et al., 2011) applied to the co-occurrence network based on keyword plus (authors' keyword as well as Scopus keywords). The whole sample of 258 documents was considered for the clustering, since after preliminary tests on the selected corpus of literature, the literature related to megaprojects belonging to book chapters, books, and conference proceedings was found to be crucial for the understanding of the bibliometric and topic analysis. However, due to the difficulty of finding the full texts of several non-article contributions, they were excluded in the content analysis step, leading to a total of 132 peer-reviewed journal articles to be scrutinised in step 3.

In order to analyse the content of the clustered articles, in the third step, the remaining 132 articles were classified and scrutinised based on various aspects, including the sub-topics identified in each cluster. Figure 1 illustrates the data collection process based on the PRISMA framework.

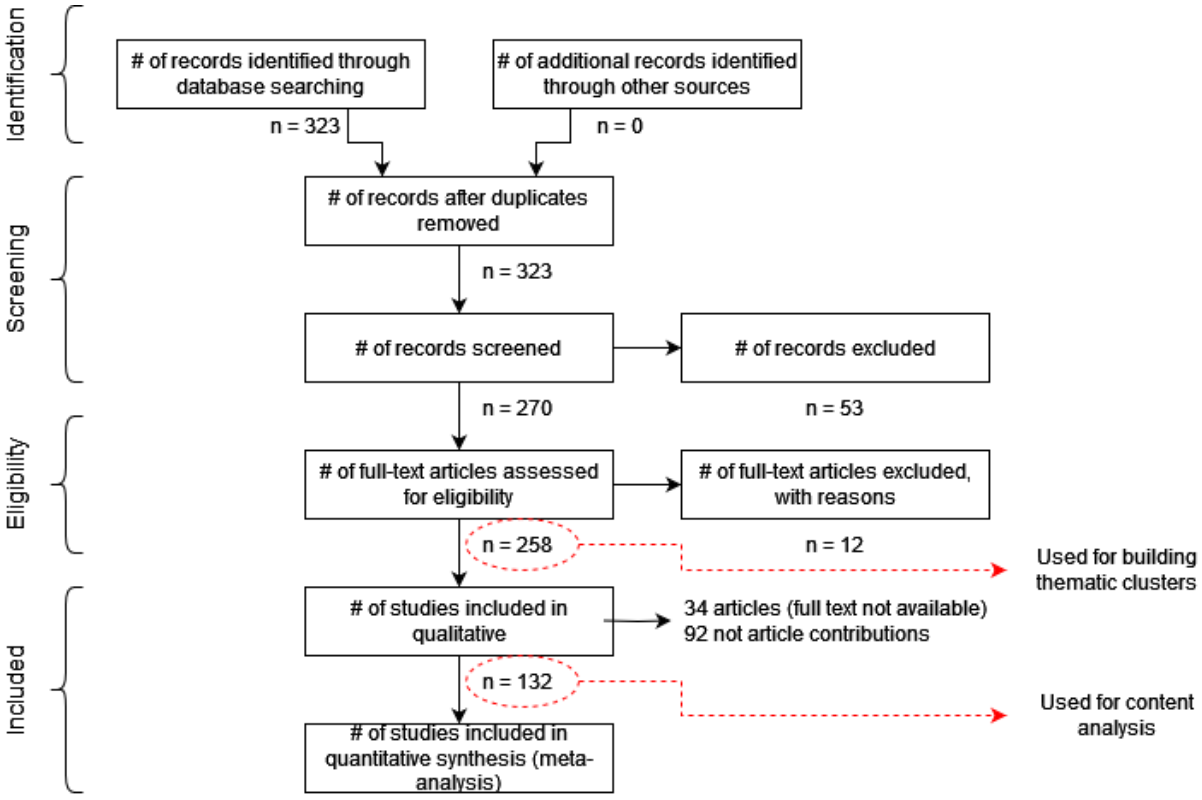

Figure 1: Flowchart of the selection process for the considered contributions

3. Results and discussion

This section begins by presenting generic information about the selected sample of documents after screening, followed by the results of clustering the documents according to their thematic similarities. Subsequently, each cluster is thoroughly examined, utilising the classification criteria outlined in the methodology section.

3.1. Publication trends

Figure 2 shows the number of contributions related to megaprojects and (large) sustainable infrastructure in the business area during the last 40 years. As can be seen, the number of contributions increased rapidly in the last decades while the scientific production on megaprojects was not well-developed untill the beginning of the 21st century. The number of published contributions increased significantly from 2013 onwards, reaching a peak in 2017 and 2021.

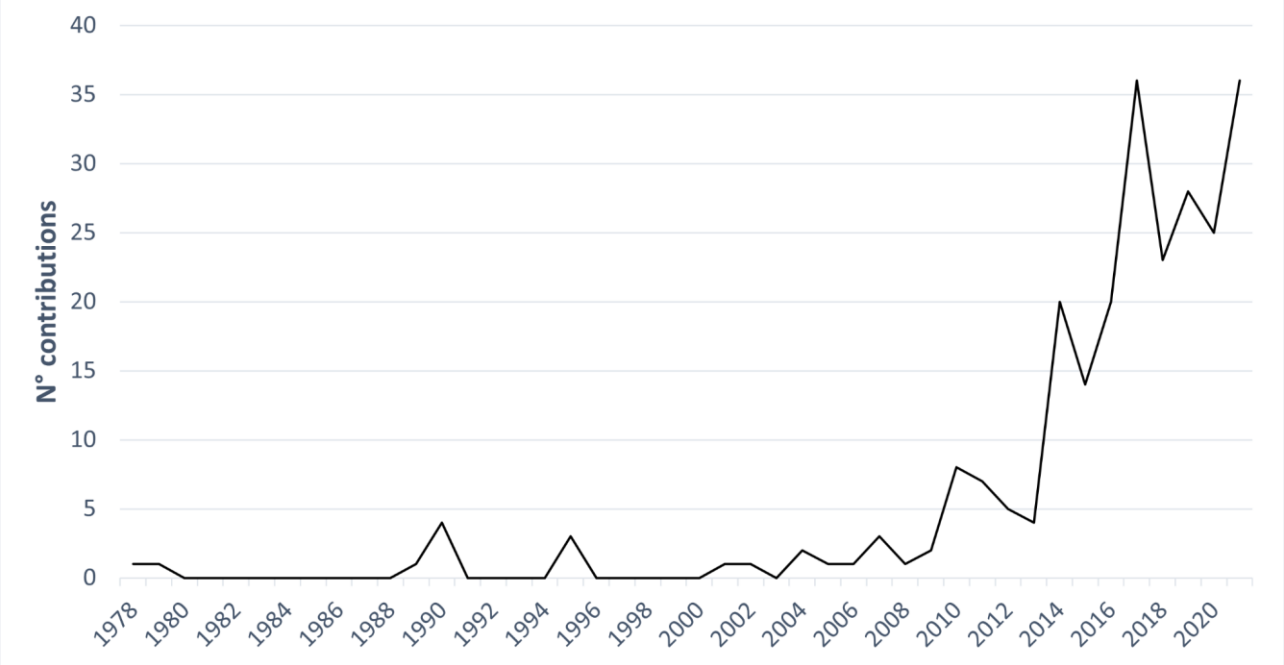

Figure 2: Number of selected contributions per year in the field of megaprojects from the lens of business, management, and accounting

Table 1 shows the number of contributions per journal and related conferences. The top journal in terms of the number of publications in the studied field is the International Journal of Project Management, which shows the steepest increase in the last decade. The second rank is shared among the International Conference on Sustainable Infrastructure 2014 (in which the Envision framework proposed by the Institute for Sustainable Infrastructure was firstly largely studied), International Journal of Managing Projects in Business, and Engineering, Construction and Architectural Management Journal. The focus of the prominent journals underscore the

predominant emphasis on project management rather than impact accounting or other topics within the realm of megaproject studies. This aspect also emerges from the thematic analysis in section 3.2 and the in-depth and thorough reading of the selected contributions.

Journal	Number of contributions
International Journal of Project Management	20
Engineering, Construction and Architectural Management	10
International Conference on Sustainable Infrastructure 2014	10
International Journal of Managing Projects in Business	10
International Conference on Sustainable Infrastructure 2019	8
International Conference on Sustainable Infrastructure 2017	7
Journal of Management in Engineering	7
Journal of Construction Engineering and Management	6
Journal of Cleaner Production	5
Journal of Professional Issues in Engineering Education and Practice	5

Table 1: Top 10 most contributing journals to the studied field.

3.2. Research themes

The selected corpus of literature consisting of 258 documents was fed into the clustering algorithm to identify clusters based on their thematic similarities. Figure 3 presents the keywords co-occurrence network, from which five distinct clusters of keywords emerge, including (i) sustainable development and decision-making, (ii) governance approach, (iii) project management, (iv) risk assessment, and (v) economic and social effects/social responsibility. This figure also

validates the diverse objectives of the studies and underscores the importance of examining megaproject management from multiple perspectives.

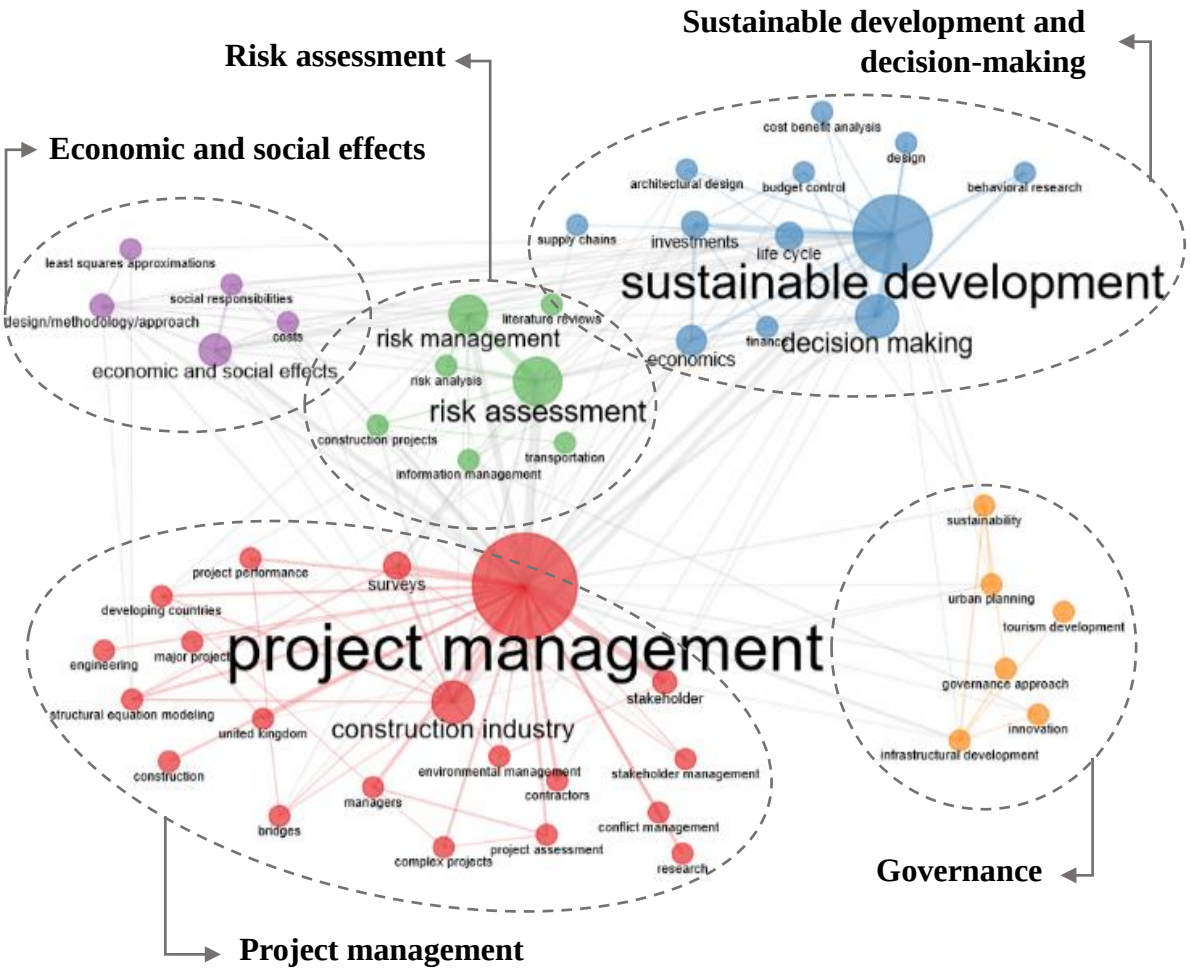

Figure 3: keyword co-occurrence network.

Furthermore, analysing keywords within each identified cluster provides valuable insights into the related sub-topics present in each cluster, which will be taken into consideration during the analysis of the content of the articles to gain a comprehensive understanding of the research areas covered. In this vein, the project management cluster focuses on the aspects such as the complexity

and performance of megaprojects, stakeholder management, and conflict resolution. The governance cluster refers to topics such as infrastructural development, urban planning, and tourism development. The sustainable development cluster encompasses decision-making processes, life cycle, supply chain analysis, investments, and budget control. Finally, the risk assessment and the social responsibility clusters primarily address economic and social impacts of megaprojects and their evaluation through different methodologies. The subsequent section delves into these topics and sub-topics in more detail.

3.3. Thematic analysis

A significant finding of the research is that issues such as megaproject impact assessment and reporting, are seldom found in the accounting literature, but it is scattered in different areas, such as project management. In this light, to analyse megaproject research from a business, management and accounting perspective, we must engage with diverse and complementary literature. Our detailed analysis of articles has led to a thematic clusterization. The subsequent subsections present the outcomes of this analysis, taking into account the sub-topics within each cluster and other relevant criteria outlined in the methodology section.

3.3.1. Project management

Project management studies constitute the largest portion of the analysed literature, covering a wide range of topics including stakeholder management (Chi et al., 2022; Mostafa & El-Gohary, 2015), contract types (Lenferink et al., 2013; L. Ma & Fu, 2022), and public-private partnerships (Shabana & Gad, 2023; Wessels, 2014). Furthermore, other studies delve into areas such as project performance (Di Maddaloni & Davis, 2017; Evans & Farrell, 2023), critical success factors (Caldas & Gupta, 2017; Lopez del Puerto & Shane, 2014), complexity (Qiu et al., 2019; Shams Esfandabadi et al., 2023), conflict management (Adityanandana & Gerber, 2019; Jia et al., 2011), trust (Cerić et al., 2021; D. Wang et al., 2020a), counter-accounting and NGO roles (Hamman, 2016), knowledge

transfer (Mainga, 2017), value creation (Chi et al., 2022; Invernizzi et al., 2019), and innovation mechanisms (Badi et al., 2020; Chen et al., 2021; J. Liu & Ma, 2020), providing a comprehensive overview of the research landscape in this field.

Stakeholder management

Stakeholder management in corporations and organisations has been extensively studied, emphasising the growing importance of both primary and secondary stakeholders alike (Freeman, 2010). In the context of megaprojects, broadening the existing issues of accountability, the influence of secondary stakeholders and local communities has finally gained attention, revealing research gaps in understanding their impact and the necessary involvement in the early stages of megaprojects (Di Maddaloni & Davis, 2017). Previous literature mainly focused on primary stakeholders (owner, suppliers, customers, sponsor, project managers), while recent studies broaden the focus, highlighting the significance of secondary stakeholders (authorities, unions, competitors, environmentalist groups, local community, or media) (Di Maddaloni & Davis, 2017). Effective stakeholder management strategies depend on various factors, including contract types for primary stakeholders and the impact on local communities for secondary stakeholders, which in turn might influence the consideration that the megaproject and its proponents have among (especially) secondary stakeholders. Therefore, developing a shared vision and sense-making processes are crucial for mitigating conflicts and risks (Chi et al., 2022; Dyer, 2017).

Contract types

Typically, contracts in project management are viewed as a technical matter (von Branconi & Loch, 2004). Previous work by Griffiths (1989) explored contract strategies, types, and advantages and disadvantages, shedding light on the need for strategic planning throughout the life cycle of megaprojects. Griffiths (1989) identified several contract types, including inter alia lump sum, re-measure, bill of quantities, schedule of rates, fixed fee, target cost, design & build, design, build &

operate, build, operate, and finance. Each contract has its own pros and cons, as well as risk-sharing issues. von Branconi & Loch (2004) identified three macro-types of contracts (i.e., fixed price, reimbursable costs, and mixed contracts) and outlined key characteristics that should be specified in each contract. The allocation of risk varies among contract types, with fixed price contracts placing the risk on the major contractor and reimbursable cost contracts sharing the risk among the clients and supplier. Lenferink et al. (2013) analysed long-term integrated contracts in Dutch infrastructure projects and highlighted the importance of green procurement, strategic asset management, and relational contracts to improve inclusiveness and sustainability. They emphasised the need for cooperative and trust-based relationships to adapt to risks and uncertainties. Moreover, private-public partnerships (PPPs) have gained significance in megaprojects, providing funding and improving project management and risk allocation (Kumaraswamy et al., 2007; Little, 2011), as well as different levels of accountability, like in the case of TELT as the public promoter of the Turin-Lyon high-speed railway (Corazza et al., 2022). Different types of PPPs, such as Design-Build (DB), Operation & Maintenance (O&M), Build-Own-Operate (BOO), Design-Build-Finance-Operate (DBFO), Build-Own-Operate-Transfer (BOOT), Buy-Build-Operate (BBO), and Finance, have varying responsibilities and financial risks, supporting and stimulating sustainable infrastructure development (Wessels, 2014).

Critical success factors and performance in megaprojects

The literature on megaprojects management also extensively explores critical success factors (CSFs) and the multifaceted nature of project performance, which shall go beyond the well-established iron triangle criteria of budget, scope and schedule (Lehtonen, 2014). Caldas & Gupta (2017) identified and classified 34 CSFs with negative impacts on megaprojects' performance into five groups, including factors related to (i) location and technology, (ii) team, organisation and communication, (iii) planning and execution processes, (iv) governance and stakeholders, and (v)

delivery strategies. Giezen (2012) analysed a metro extension project in the Rotterdam region and identified CSFs such as optimism bias, strategic misrepresentations, technological challenges, and the effect of political changes. Lopez del Puerto & Shane (2014) adopted the iron triangle of project management – cost, schedule, and technical – and identified early agreements, understanding cultural and socio-political circumstances, public outreach and aspects that impact the delivery system as crucial CSFs. Cepeda et al. (2018) ranked more than thirty CSFs for megaprojects' delivery in Colombia and found that inadequate information during the front-end phase, design variations during the construction phase and limited supply availability had the most adverse impact. Turner & Xue (2018) discussed three levels of project success, including outputs, outcomes, and impacts, similar to a Social Return on Investment (SROI) analysis. Similarly, Fahri et al. (2015) reviewed CSFs in megaprojects by focusing on the ex-post-project evaluation (EPPE) phase. Generally, projects and megaprojects are evaluated at the point of delivery (i.e., at the end of the construction phase) and there is no obligation and duty to evaluate long-term outputs, outcomes, and impacts (Ahsan & Gunawan, 2010). Hu et al. (2012) analysed the successful case study of the Shanghai Expo construction and proposed a multi-criteria incentives framework to improve the safety, quality, and environmental performances, as well as the migrant worker management. To do so, the authors identified a list of CSFs, including rule design, process orientation, top management support, training and promotion, communication in process, and process learning and improvement.

Megaprojects' complexity and conflict management

Complexity in megaprojects encompasses various challenges, including technological complexity, stakeholder management complexity, risk prediction, and conflict management. Nyarirangwe & Babatunde (2021) conducted a literature review on complexity factors and project performance in construction and ICT megaprojects. They proposed an evaluation framework incorporating both economic and non-economic aspects, such as financial impact, economic impact,

social impact, environmental impact, efficiency, delivery schedule, and organisational goals. The authors emphasised the importance of managing megaprojects as complex adaptive systems, utilising attributes from complex system theory, such as modular structure, adaptive capacity, self-organisation, emergence, and non-linearity. Qiu et al. (2019) discussed institutional complexity in megaprojects, analysing the Hong Kong-Zhuhai-Macao Bridge project as a case study. They identified six types of complexity, which influence megaprojects' success: regulatory, political, social, cultural, relational, and evolutionary complexities. Each type involves different stakeholders, highlighting the significance of understanding and managing diverse complexities within both the internal and external project environments.

The concept of complexity in megaprojects is closely tied to risk and uncertainty management. Kardes et al. (2013) explored the characteristics and levels of complexity in megaprojects, such as time, cost, team composition, technology, and stakeholder management. They distinguished between complicated and complex systems, emphasising the need for flexible project management and risk assessment frameworks. Giezen (2012), analysing a metro extension case study, discussed the reduction of complexity in megaprojects using *Keep It Simple Stupid* (KISS) principle of project management (Terano, 2008), examining predict-and-control and prepare-and-commit approaches to project management (Koppenjan et al., 2011).

Conflicts often arise in megaprojects, leading to delays and disputes. Thamhain & Wilemon (1975) categorised conflict causes into seven groups, including project priorities, administrative procedures, trade-offs, manpower resources, technical performance, cost, and schedules. Other causes such as communication or reward structure, politics, leadership, or ambiguous roles can be considered in addition (Kezsbom, 1992). Similarly, Moore (2014) grouped conflicts based on value, relationship, interest, data, and structural conflicts, while Boudet et al. (2011) classified conflicts with respect to contextual factors, project characteristics, and local impacts. Lee et al. (2017)

proposed a conflict management framework, including scenarios like project termination, early and late mitigation, and project enforcement. Teo & Loosemore (2010) analysed community-based protests in megaprojects, emphasising the cyclical nature of protests and the importance of understanding group dynamics. Jia et al. (2011) studied the positive interaction between megaprojects and social conflicts, suggesting that conflicts can lead to societal progress and value evolution.

Bargaining and disputes among contractors and primary stakeholders are common but understudied aspects of megaprojects. Chang (2013) discussed a case of bargaining during the construction of the Channel Tunnel Rail between private investors and the UK government, highlighting the importance of finding a balance between price competition and long-term industry development. van Marrewijk et al. (2016) analysed the Panama Canal megaproject, uncovering the coexistence of conflicts and order situations in temporary project organisations.

Trust

In the context of project management, it is important to consider additional topics beyond the traditional scope. For the innate complexity of megaprojects, one such topic is certainly trust, which has been extensively studied by Cerić et al. (2021). Through a comprehensive literature review, they identified six key aspects related to trust: the success of megaprojects, institutional trust, delivery methods, contacts, governance mechanism, and project management skills. Trust is defined as the "*willingness of a party to be vulnerable to the actions of another party based on positive expectations regarding the other party's motivation*" (Rousseau et al., 1998). Cerić et al. (2021) emphasised that trust plays a vital role in the delivery and success of megaprojects. It fosters cooperation among stakeholders (Cook et al., 2005) by substituting control mechanisms (Rousseau et al., 1998), thereby reducing costs. Trust also decreases the need for complicated contractual arrangements among parties (Kadefors, 2004; D. Wang et al., 2020b). Conversely, a lack of trust in the organisation

responsible for infrastructure can have a detrimental impact on the overall performance and success of a megaproject. Any form of distrust can potentially lead to the failure of the entire megaproject. In this sense, the role of non-governmental organisations (NGOs) as watchdogs and counter-accounting activities become significant, as they can influence public opinion either in support of or against a particular project, as highlighted by Hamman(2016).

3.3.2. Governance

Governance plays a fundamental role in the context of megaprojects, as underlined in previous studies. It encompasses various aspects, such as stakeholder management (Derakhshan et al., 2019) sustainability strategies (Brunet & Aubry, 2018; Roelich et al., 2015), and long-term territorial effects. As megaprojects have the potential to shape large territories for several decades, an effective governance is essential, especially in infrastructural territorialization strategies (Daye et al., 2020; Golubchikov, 2017; Rocha & Neves, 2018), tourism development (Bowerman, 2021; Rehman et al., 2020), and urban planning (Y. Li et al., 2019; Zheng, 2020). The concept of governance involves the engagement of multiple actors in an economic transaction to reach the most efficient shared value through a monitoring and controlling mechanism (Williamson, 1979). Thus, governance is intrinsically intertwined with the stakeholders involved in the transaction. In the context of project management, governance is viewed as a multi-level process that addresses the actors (contractors, suppliers, and the main owner) and their relationships (Derakhshan et al., 2019). Various governance theories, such as stakeholder theory, stewardship theory, and transaction cost economics, are applied to different levels of projects (organizational, portfolio, or project level), stakeholders (internal or external), and project factors (e.g., success, ethics, and transparency), as highlighted by Derakhshan et al. (2019). In this sense, for instance, Lehtonen (2014) and Lehtonen et al. (2017) studied multiple accountability relationships and proposed a novel framework, i.e., a network mapping, to evaluate socio-economic aspects of megaprojects from which a new crucial

'governing' role, the evaluator, emerged. However, there are still many underdeveloped aspects in the literature, including the functioning of non-monetary transactions, the critical factors for maintaining successful relations with society, and the influence of external stakeholders on decision-making processes.

Infrastructural territorialization

Megaprojects have a profound and lasting impact on local territories, shaping their development over decades. Ensuring democratic and efficient territorial development is paramount in comprehending the governance of megaprojects. Governance goes beyond government borders and roles, encompassing a complex decision-making process that involves the legitimacy of the public space and power distribution among different actors and stakeholders affected by the decision-making process (Rocha & Neves, 2018). In the literature, two governance approaches have emerged: centralised authority consolidated by local governments (Savitch & Vogel, 2004) and delocalized governance involving cooperative public and private entities (Feiock, 2004). For instance, Erie & MacKenzie (2010) compared governance approaches in port and airport megaprojects in Southern California, calling for stakeholder coalitions and cooperation between public and private entities. Rocha & Neves (2018), examined hydroelectric projects in the Brazilian Amazon and defined governance of megaprojects as a territorial development strategy involving primary and secondary stakeholders. The long-term effects and territory-shaping role of megaprojects were studied by Golubchikov (2017) in the case of the Sochi Winter Olympics mega-event, and it was found that the investment in the Olympics not only shaped the physical infrastructure but also influenced governance and local institutions as part of a national strategy aimed at integrating the periphery. Leksin & Porfiryev (2015) studied the governance of the Russian Arctic redevelopment, emphasising the integration of local territorial units with state programs, environmental balance, preservation of local cultures and traditions, and biodiversity conservation.

Tourism development

The selected literature encompasses studies on the governance of megaprojects and their impact on tourism development. For instance, Bowerman (2021) discussed the competing forces shaping Vietnam tourism development post COVID-19, with private investments driving large-scale infrastructure projects and innovative startups promoting small-scale, sustainable tourism. Shakirova (2015) examined Kazakhstan's national branding efforts through hosting mega-events, stressing the need to meet local population's needs for sustainable outcomes. Daye et al. (2020) discussed the contrasting perceptions of tourism stakeholders regarding China's Belt and Road Initiative (BRI), with some viewing it as an opportunity for prosperity and others perceiving it as a threat to sovereignty and terrorism. Kanwal et al. (2020) investigated the impact of road and transportation infrastructure on tourism development in the framework of the China-Pakistan Economic Corridor (CPEC), highlighting the positive relationship between community support and infrastructure development, but noting negative perceptions due to environmental impacts. Rehman et al. (2020) analysed the impact of ICT infrastructure on tourism development in countries affected by the BRI, discovering long-term associations between tourism expenditure and ICT infrastructure in developed countries and short-term connections in developing countries. Overall, these studies provide insights into the governance and impacts of megaprojects on tourism development.

Urban Planning

Megaprojects at the city scale have significant impacts on the future of a city. Mega-events for instance, can serve as soft power tools to improve local tourism development (Sroka, 2021), while megaprojects such as oil and gas pipelines, energy, and transportation infrastructure strongly impact a city's carrying capacity (Zheng, 2020). Thus, Zheng (2020) suggests that the planning of megaprojects should be integrated with urban planning policies, considering economic, social, and

environmental aspects as well as carrying capacity. Similarly, Dogan & Stupar (2017) analysed a case study in Istanbul, highlighting three key impacts that should be considered for megaprojects in cities: urban structure, environment, and the local community. The management of megaprojects requires considering several aspects and stakeholders, spanning from national identity (Ye et al., 2023) to local community (Babaei et al., 2023), and from carrying capacity (Kibalov & Pyataev, 2022) to stakeholders' perception (Shabana & Gad, 2023; Xue et al., 2023). In this sense, Li et al. (2018) proposed a dynamic governance framework for managing megaprojects, which includes governance structure, governance mechanism, and external environment. Li et al. (2018), proposed adopting a multi-level evolutionary governance theory (EGT) for governance of mega-event projects due to their multidimensional and multipurpose nature. They argued that mega-event projects require special governance regimes, and they pointed at the World Expo 2010 as an example of a three-level governance structure, involving the government and large-state-owned enterprises at different levels.

3.3.3. Decision-making

This subsection focuses on decision-making processes, decision supporting tools, and the prioritisation of important aspects and factors related to megaprojects. Wei et al. (2016) proposed a participatory multicriteria decision analysis to achieve consensus among stakeholders by considering sustainability criteria in transportation projects in China, and emphasised that early-stage participatory processes help increase accountability and avoid conflicts during later phases of the megaprojects. Decision-making processes related to sustainable development and infrastructure sustainability require evaluating embodied impacts and conducting environmental assessments in the early stages (R. Zeng et al., 2021)). The Envision rating system is a widely adopted tool for evaluating the sustainability of infrastructure projects, but it has faced criticisms for potential biases and suboptimal solutions (McWhirter & Shealy, 2018; Shealy et al., 2016; Shealy &

Klotz, 2015a). Holistic methodologies and approaches have been developed to support the decision-making process at the macro-level, such as evaluating policy scenarios using systems dynamics and assessing the social cost of carbon (Destyanto et al., 2017). Accounting practices can also support decision-making, such as the choice of the best contract type based on the risk assessment (Al Nahyan et al., 2022). Cost-Benefit analyses (CBA) are also commonly used in megaprojects, but they tend to overlook social equity issues (Litman & Brenman, 2012). Mostafa & El-Gohary (2015) developed a comprehensive ontological model considering various stakeholders and multiple benefits and costs to address social, economic and environmental aspects. Accounting practices play, therefore, a crucial role in making informed choices in complex environments.

3.3.4. Economic and social impacts

The impacts of projects and megaprojects have been extensively studied, with early research dating back to the late 1970s (Barrett, 1979; Connor-Lajambe, 1990; McCoy & Singer, 1978). In recent decades, there has been a significant analysis of economic, social and environmental impacts of megaprojects. Various assessment methodologies (Nourelfath et al., 2022) and indicators systems (Lin et al., 2017) have been developed to consider these impacts, although several aspects are still under debate. A current area of interest is the concept of megaprojects social responsibility (MSR), which aims to expand traditional Corporate Social Responsibility (CSR) to megaprojects. The Envision rating system has been introduced to evaluate and predict the impact of megaprojects and promote sustainable infrastructure (Shealy & Klotz, 2015b).

Early research on impacts targeted social and cultural aspects (McCoy & Singer, 1978) and environmental aspects (Barrett, 1979). Socio-cultural characteristic matrices were developed to support the industrial location siting process, considering factors such as population dynamics, social participation, and housing conditions (McCoy & Singer, 1978). Environmental impact assessment originated in the 1970s in the UK and the USA, initially through the introduction of

“Environmental Impact Statements” as mandatory documents for large public projects under the National Environmental Policy Act (NEPA) of 1970 (Barrett, 1979). Although these statements encouraged the evaluation of social and economic impacts alongside environmental impacts, accurately assessing megaproject impacts remained challenging due to their complexity (Connor-Lajambe, 1990; Sabin, 1995).

Recently, there has been a growing recognition of the holistic nature of megaprojects impacts, facilitated by the introduction of MSR (H. Ma et al., 2020) and the development of indicator systems and evaluation frameworks (Lin et al., 2017). MSR encompasses the policies and practices of stakeholders throughout the project life cycle, reflecting responsibilities for the well-being of society (S. X. X. Zeng et al., 2015). A framework with over 60 indicators has been proposed to convert strategic objectives into practical guidance, focusing on economic, legal, ethical, and political responsibilities (Lin et al., 2017). Classification of impacts into positive and negative, short-term, mid-term, and long-term has also proven useful for understanding the different phases of megaprojects and for the development of a multi-level framework (Zidane et al., 2016).

Despite progress, there are still several research gaps in the impact assessment of megaprojects. In this sense, Lehtonen (2014), indeed, pointed out how social aspects and social impact assessment practices of megaprojects is typically considered together with economic aspects – in a symbiotic relationships, i.e. socio-economic – where the complex nature of the social aspects such as stakeholder management, conflict management, environmental justice, just to mention a few, is oversimplified to quantitative indicators. Therefore, one challenge is to develop a framework that considers stakeholders opinions and perceptions, their relationships, by eventually varying weights of indicators based on stakeholder types or interactions (Lin et al., 2017). Studies have shown that MSR influences the financial and social performance of organisations, with interactions with secondary stakeholders strengthening positive effects, while interactions with

primary and internal stakeholders may provoke unethical behaviours (Cerić et al., 2021; H. Ma et al., 2020; G. Wang et al., 2017). Various methodologies have been explored, including Input-Output tables (Nourelfath et al., 2022), emergy assessment (Cristiano & Gonella, 2019), and embodied impact analysis (R. Zeng et al., 2021), but they may not fully incorporate specific cultural and social aspects. Recent studies have focused on specific impacts of megaprojects, such as on housing prices (Famuyiwa & Kayode Babawale, 2014), city carrying capacity (Zheng, 2020), and access to education facilities (Wei et al., 2016).

3.3.5. Risk assessment

Accounting practices play a crucial role in risk assessment of megaprojects by providing valuable insights into the economic, social, and environmental impacts (Boateng et al., 2015). These practices should not be limited ex-post activities but should also include ex-ante evaluations, for a wise, long-term strategic planning. It is crucial to consider different influencing factors, including social and environmental aspects, and engage stakeholders through multicriteria decision analyses, cost-benefit analyses or other approaches and methodologies. Risk management involves planning, identifying, analysing, and monitoring risks (Project Management Institute, 2017), and based on potential impacts, it can support decision-making processes, project management, and governance.

Risk can be classified into three groups based on their cause: technical and operational risks, market risks, and institutional and social risks (Miller & Lessard, 2007). Wang & Pitsis (2020) analysed the megaproject crisis in China and identified factors such as the lack of project management skills, clash of interest, lack of responsibility, red tape and centralization, and lack of ability to forecast as crisis orientations that can impact risk management. Crises are low probability, high impact events that can strongly affect projects (Pearson & Clair, 1998). Boateng et al. (2015) identified social, technical, economic, environmental and political (STEEP) risks in the Edinburgh Tram Network project, with technical and economic risks being the highest priorities, according to

stakeholder opinions. Social responsibility and understanding the social and cultural context can mitigate social and environmental risks (Dyer, 2017). Z. Liu et al. (2016) analysed the Jixian Industrial Park project and proposed mitigating factors such as extensive communication campaigns, information disclosure, and compensation measures for resettlements. Social and environmental risks can be translated into financial and economic terms as evaluated by Hidayatno et al.(2015). Early risk assessment during the planning phase supports the performance and the success of a megaproject, as cost influence decreases with time and uncertainties are higher in the planning phase (Abdul-Kadir & Price, 1995) . Risks directly impact project management, cost, and schedule performance (Kim, 2010). The lack of risk assessment during the planning phase can lead to project failure, as seen in the historical analysis of the Panama Canal construction project (Sandhu & Khan, 2017).

4. Future research agenda

The five macro areas emerging from the analysis in this research, namely, project management, governance, decision-making, social and economic effects, and risk assessment, are highly interconnected and cannot be analysed independently due to the intrinsic complexity of megaproject management. While project management focuses on managerial skills and delivering projects on time and within budget, the success of megaprojects is also affected by external factors that require participatory decision-making processes, inclusive governance, and dialogic accountabilities to mitigate future risks of conflicts and disputes. Moreover, accounting practices should not be limited to ex-post evaluations but should also consider the prediction of possible risks and unexpected events in the earlier phases of the project. However, there are several research gaps in business, management, and accounting studies related to megaprojects.

One significant research gap is the limited consideration of the use/operation and the EoL phases of megaprojects. Most studies focus on the planning, design, and construction phases, while

the use and EoL phases are often neglected. The few studies that address the EoL phase mainly focus on decommissioning nuclear power plants, post-use of infrastructure built for mega-events, or urban transition planning projects, but they do not quantitatively analyse the generated impacts (Jain & Rohracher, 2022; Mulholland et al., 2020). Similarly, critical success factors during the use, post-use and EoL phases are not extensively studied compared to the planning, design, and construction phases (Fahri et al., 2015; Turner & Xue, 2018) .

Another research gap lies in the type of evaluation conducted. While many studies focus on the initial stages of establishing scope and identifying stakeholders, and mapping outcomes, only a few quantitatively evaluate the impacts (Hidayatno et al., 2015; Kim, 2010). Demonstrating outcomes and giving them a value is not adequately developed in the literature. Translating impacts into economic and financial terms is also limited, despite the inclusion of different impacts in qualitative or theoretical analyses (Kim, 2010).

The reporting, using, and embedding the stages of SROI analysis is another area that lacks sufficient attention. Communication strategies and reporting have been considered important in megaprojects, but they are not extensively studied. However, recent efforts in China have highlighted communication as a fundamental axis for the development of megaprojects and to avoid social conflicts (Z. Liu et al., 2016).

There are additional gaps related to the evaluation of the Envision rating system that deeply analyzes the efficacy of the novel rating system in terms of supporting decision-makers, bottom-up decision-making processes, stakeholder engagement, and inclusive governance. While the efficacy of the Envision rating system during the design and planning phase has been analysed, there is a lack of studies evaluating the real impacts generated after construction. Furthermore, the understanding of inclusive activities primarily focuses on the success of project managers rather

than addressing the needs of secondary stakeholders. Novel methodologies such as system dynamics and system thinking are emerging to address forecasting errors and analyse megaprojects as complex systems (Cristiano & Gonella, 2019; Destyanto et al., 2017).

RQ1 - What are the main research themes in the field of megaprojects considered in the business, management, and accounting subject area?	
PROJECT MANAGEMENT	·Stakeholder management ·Contract types ·Critical success factors and performance ·Megaproject complexity and conflict management ·Trust
GOVERNANCE	·Infrastructural territorialization ·Tourism development ·Urban planning
DECISION MAKING	
ECONOMIC AND SOCIAL IMPACTS	
RISK ASSESSMENT	

Table 1 - Main findings for Research Question 1

RQ2 - What are the research gaps in the megaprojects domain to be potentially considered in future research by researchers in the field of business, management, and accounting?	
MORE FOCUS ON THE USE, POST USE AND END-OF-LIFE PHASES	·Generated Impacts ·Critical Success Factors and Performance
	·Lack of Quantification of Outcomes

EMPHASIS ON IMPACT EVALUATION	·Limited translation of impacts in economic and financial terms ·Strengthening the efficacy of the Envision rating system to evaluate the impacts after construction
ENGAGEMENT OF SECONDARY STAKEHOLDERS	·System thinking and system dynamics as tools to support managers in forecasting errors and analyse megaprojects as complex systems

Table 2 - Main findings for Research Question 2

5. Conclusion

Due to the increasing interest of scholars to delve into various aspects of the complex nature of megaprojects, a huge amount of research has been performed in this area, creating a fragmented literature. The present study aimed to provide an inclusive image of the body of knowledge in the field of megaprojects from the lens of business, management, and accounting studies by conducting a systematic literature review. The results shed light on various research themes of the megaproject research by clustering articles based on their key-words co-occurrence. The identified thematic clusters include (i) project management, (ii) governance, (iii) decision-making, (iv) social and economic impacts, and (v) risk assessment. Furthermore, the content of the articles in each cluster was scrutinised to provide insights on various issues and concerns in megaprojects, such as stakeholder management, contracts, critical success factors and performance, conflict management, trust, Infrastructural territorialization, urban planning, and economic and social impacts.

Scrutinising the content of the articles revealed that the majority of research works still emphasise project management and the technical aspects of megaprojects, although a more holistic vision of impacts is emerging. In addition, there is a dearth of studies on the use and post-use/EoL phases, and only a few attempts have been made to translate the social and environmental impacts of

megaprojects into economic and financial terms. Moreover, the relationships between reporting activities and project performance remain understudied. Based on the research gaps identified, promising areas for future research can include the integration of comprehensive sustainability metrics into accounting and reporting practices, examining risk assessment and ethical considerations, and exploring the impact of innovation and technology integration.

The provided insights support decision-makers and policy-makers for further developments in the field of megaprojects. Furthermore, these insights can provide researchers with a general map of research in this area, supporting them in identifying the critical challenges and bottlenecks in this field of research and underscoring the gaps to be potentially covered in their future research.

This study is inevitably subject to limitations. First, Scopus was used as the main database for retrieving the article sample in this research. Future research could benefit from adding other databases, such as Web of Science, to obtain a more comprehensive understanding of the studied topic. Second, the selection of articles in this research was limited to the “business, management, and accounting” subject area in the Scopus database. Removing this limitation and further extending the search in other specified subject areas in Scopus that contain documents related to megaprojects research could provide a better overview of the studied aspects of megaprojects within the whole database. Third, the thematic clustering of articles was conducted based on the keywords co-occurrence network. We suggest exploring alternative data clustering techniques, such as bibliographic coupling and co-citation analysis of articles, to enhance the development and comparison of results. Finally, our sample selection focused solely on articles published in the English language. To refine the research findings, further investigations could include non-English articles and other documents.

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