

Why Do Megaprojects Underperform? A Systematic Literature Review of the Causes of Poor Performance and Strategies for Improving Project Outcomes

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ABSTRACT: Large-scale capital projects that typically cost over \$1 billion are called megaprojects and can have a significant impact on the economy, the landscape, and entire societies. While most of these projects have not met their cost, benefit, or schedule goals, they continue to grow in number and size. This persistent gap between ambition and delivery is usually referred to as the “megaproject paradox”, and is what drives this present review. The study was conducted using a systematic review protocol that was developed in accordance with PRISMA principles, and used the Critical Appraisal Skills Program (CASP) framework to assess the quality of the 37 peer-reviewed articles identified between 2014 and 2024 in Scopus, Web of Science and Google Scholar, and analyzed them thematically to address two questions: why do megaprojects underperform and what can be done to improve their delivery? This integrated view of the causes of underperformance, condensed into seven themes, is set to define the problems. There are seven themes with interrelated causes of underperformance, and they will be problem definitions. A set of evidence-based improvement strategies derived from the literature reviewed is mapped to each of these. The results suggest that the failure of megaprojects is rarely a simple matter of one isolated cause; instead, it is an outcome of a combination of technical, organizational and institutional factors, and thus, for lasting improvements, a coordinated approach is needed for governance, cost control, stakeholder engagement and leadership development, but not a combination of isolated fixes. These results are compared with the more recent systematic reviews of megaproject performance, with their theoretical and managerial implications, and an agenda of future empirical research is outlined.

KEYWORDS: Megaprojects, Project Performance, Project Failure, Causes, Strategies, Systematic Literature Review

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Introduction

The Megaproject Phenomenon

Two decades of rapid urbanization and globalization have driven an unprecedented surge of spending on megaprojects. While the term itself goes back to the mid-1970s (Li et al., 2018), megaproject management did not become a recognized field of academic and practical inquiry until after 2000 (Pollack et al., 2018). Flyvbjerg (2014) puts annual global spending on such ventures at somewhere between US\$6 and US\$9 trillion, a figure that echoes The Economist's (2008) remark that "the biggest investment boom in history is under way." McKinsey has made a comparable projection, estimating that global infrastructure investment would need to approach US\$57 trillion between 2013 and 2030 simply to keep pace with demand (Dobbs et al., 2013). Megaprojects are commonly defined as large, one-off capital investments undertaken by both public and private actors (Caldas & Gupta, 2017); a recent review of European megaprojects goes further, describing them as huge, compelling, costly, contested and inherently hard to fully grasp (Brooks, 2015).

The sums at stake are so large that the fallout from failure rarely stays confined to the project owner — entire firms, and sometimes national economies, can be shaken when a megaproject collapses. Priemus and van Wee (2013) and Merrow (2011) both characterize megaprojects — those with capital costs of US\$1 billion or more — as notoriously hard to manage; Merrow's (2011) analysis of 318 such projects found that over 65 percent fell short of their original goals, mostly through budget or schedule overruns. Part of this fragility is due to the level of complexity that is inherent in megaprojects: a small incident can have a large impact, as in the case of megaprojects, which are non-linear systems (Remington & Pollack, 2016); and significant changes in the context can occur in the lead up to the completion of a megaproject (Turner & Xue, 2018). Megaprojects have the potential to advance regional development for a generation when done well and decelerate it for years when done poorly (Merrow, 2011). Underperformance has been attributed to project size, uncertainty, urgency, institutional complexity and the number of parties involved (Flyvbjerg, 2017; Merrow, 2011; Erol et al., 2018), conflicting interests of stakeholders (Wu et al., 2017), rent-seeking behavior (Flyvbjerg, 2014), corruption (Veenswijk et al., 2010), politically driven decisions, immature initial designs and scope creep (Flyvbjerg, 2014), and chronic cost overruns (Callegari et al., 2018). However, this review takes up Flyvbjerg's (2014) explicit call to investigate what remedial action might be like.

Problem Statement and Research Gap

In literature, megaprojects are often hailed as symbols of modern development and political success (Van Marrewijk, 2017), with the success of a megaproject providing significant urban, economic and industrial benefits (Ma & Fu, 2020). But the delivery record is not as rosy. A review of over 300 megaprojects by Merrow (2011) revealed that about 65 percent failed to deliver on their performance targets, while another study cited that, on average, 73 percent of megaprojects are over budget, and 64 percent are over schedule. The results of Eweje et al. (2012) also showed that 85% of the project managers surveyed were experiencing moderate to severe stress to control cost and schedule. Despite decades of experience and a vast quantity of academic literature, there is still no consensus on a clear, actionable understanding of what is causing the failure of megaprojects or what cures are most effective (Söderlund et al., 2017). The "black box" which this review seeks to close is that of the various factors that have been discovered in empirical literature over the past 10 years that cause poor megaproject performance, and the strategies that have been proposed to deal with these poor performances.

Research Questions and Objectives

This review is structured around two research questions:

RQ1: What are the main drivers behind poor performance in megaprojects?

RQ2: What strategies has the literature proposed for managing and reducing this poor performance?

Building on these questions, the review sets out to (a) identify and consolidate the main causes of megaproject underperformance reported in recent peer-reviewed research, and (b) bring together the corresponding strategies that project managers and policymakers can use to improve outcomes.

Conceptual Background

Defining Megaprojects

No single, universally accepted definition of a megaproject exists (Erol et al., 2018). Flyvbjerg's (2014) foundational work frames megaprojects as a distinct stage of social and economic development, whereas Merrow (2011) anchors the concept to a cost threshold of US\$1 billion (in 2003 dollars). Other definitions foreground impact rather than cost alone: Gellert and Lynch (2003) describe megaprojects as coordinated applications of capital and state power that reshape landscapes quickly and visibly, while Flyvbjerg (2017) frames them as transformational, multi-stakeholder ventures affecting millions of people over many years. Kardes et al. (2013) argue that cost alone is an incomplete lens and that megaprojects are better understood through what sets them apart from ordinary projects — their scale, staffing needs, funding structures, and the way uncertainty propagates through interacting components (He et al., 2022). Van Marrewijk (2017) adds task size, duration, stakeholder plurality, cross-national involvement, uncertainty and political salience to this list of distinguishing features. Drawing on this body of work, megaprojects can broadly be split into technical complexity, tied to sheer scale (Wu et al., 2018), and social complexity, tied to the density of relationships among the people delivering the project. However, the Channel Tunnel is often cited as an example where both forms of complexity were present at once (Pitsis et al., 2018). For the purposes of this review, and in line with the synthesis offered by Caldas and Gupta (2017), megaprojects are treated as capital investments exceeding US\$1 billion that combine substantial stakeholder involvement, multiple interfaces, resource constraints, technological novelty, regulatory complexity, geographic dispersion, and significant political, economic, environmental, or social consequences.

Characteristics of Megaprojects

Even as there are some debates about definition, there is a consistent litany of features that emerge from literature. Megaprojects typically involve both the scale of projects and the technological ambition to meet the scale (Ma & Fu, 2020); they span unusually long timescales, rendering them more susceptible to contextual change that occurs over years (Brookes et al., 2017); and they require massive amounts of labor, capital, and material with US\$1 billion typically being the threshold used to define them (Batty, 2013). The results of these projects have immediate implications for the reputation of the government and the officials involved (Altshuler & Luberoff, 2004; Kundu et al., 2023), and they are embedded in a complex network of interdependent and sometimes conflicting public interests which can change over time as the political climate evolves (Bovensiepen & Yoder, 2018). Reconciling the various and often competing interests of the many parties involved (public agencies, private financiers, contractors, local communities) is an ongoing management challenge (Altshuler & Luberoff, 2004; He et al., 2022). Technological novelty is common, which means past experience often offers limited guidance (Rezvani & Khosravi, 2018) — part of why Miller and Lessard (2001) describe megaprojects as a kind of “engineering craft business” built around unique, largely non-repeatable products. Finally, megaprojects tend to produce outsized, long-lasting and

unevenly distributed social and environmental effects (Vanclay, 2016; Li et al., 2019), which can provoke public opposition or organized resistance (Altshuler & Luberoﬀ, 2004) and which are becoming increasingly visible through media coverage (Ninan et al., 2019).

The Megaproject Paradox: Growth Amid Persistent Underperformance

A recurring feature of this literature is what Flyvbjerg (2014) call the “megaproject paradox”: despite a well-documented history of cost overruns, schedule slippage and stakeholder dissatisfaction, the number and scale of megaprojects keep growing. Flyvbjerg (2017) illustrates the scale involved by comparing individual megaprojects — such as the Joint Strike Fighter program, valued at close to US\$400 billion — with the GDP of entire nations. Rising infrastructure demand is one obvious driver of this growth (Xiaolong et al., 2021); McKinsey estimates that keeping pace with projected global GDP growth will require close to US\$57 trillion in infrastructure investment by 2030 (Garemo et al., 2015), a figure the OECD puts at a comparable US\$6.3 trillion per year over 2016–2030 (Mirabile et al., 2017). Megaprojects are not confined to infrastructure, either: Business Insider's list of the world's largest megaprojects includes a US\$64 billion theme park development in Dubai (Desjardins, 2017), and urban planners expect future stadiums and museums to follow suit (Altshuler & Luberoﬀ, 2004; Siemiatycki, 2017). Futurist Thomas Frey goes further still, forecasting that megaprojects could account for roughly a quarter of global GDP within a decade, extending into fields such as extreme-weather mitigation, large-scale data management and disease control (Frey, 2017). Against this backdrop of continued expansion, scholars increasingly frame the field's central challenge as one of “under-performance” and call for a rethink of the tools and methods used to manage modern megaprojects (Lenfle & Loch, 2017).

Empirical Evidence on Megaproject Performance

Rigorous, statistically grounded studies of megaproject performance remain relatively scarce, with much of the evidence base resting on case studies (Brookes, 2017). Two large-scale exceptions stand out. Merrow (2011) examined 318 large industrial projects spanning oil and gas, mining, pharmaceutical-chemical and power-generation sectors and found that only 35 percent could be classed as successful, with failed projects overrunning budget by an average of 40 percent and schedule by 28 percent. Flyvbjerg (2014), working in the transportation sector, documented cost overruns of 50 to 100 percent as typical, with overruns beyond 100 percent far from rare. Across 50 large projects, in the power generation, transportation and oil extraction sectors, less than half achieved most of the goals set and almost 20 percent were failures or uncompleted projects, according to Miller and Lessard (2001). The Central Artery/Tunnel Project (or “the Big Dig”) in Boston, Massachusetts serves as a popular example, having been estimated in the early planning stages at US\$2.8 billion, but ending up at about US\$14.6 billion (potential exposure as high as US\$22 billion), safety failures, design mistakes, claims of inferior materials, and restitution payments of over US\$450 million. Callegari et al. (2018) similarly found that power-generation megaprojects ran, on average, 97.53 percent over their initial cost estimates and 74.28 percent (roughly 3.5 years) over schedule. Taken together, this body of evidence supports Caldas and Gupta's (2017) observation that, despite more than two decades of accumulated experience, organizations have made little demonstrable progress toward delivering megaprojects to their original targets and that once a megaproject starts to slip in one dimension, it tends to slip across most others (Merrow, 2011; Crosby, 2017).

Methodology

Research Design and Philosophical Stance

This study follows a qualitative, interpretivist research design, on the grounds that interpretivism lets the researcher bring together diverse scholarly perspectives on a socially embedded phenomenon such as megaproject performance (Bell et al., 2022). Rather than testing a predefined hypothesis, the study synthesizes and interprets a broad body of existing qualitative and mixed-method findings in order to identify the causes of megaproject underperformance and the strategies proposed to address them. A systematic literature review (SLR) was chosen as the research strategy because it offers a transparent, replicable, and comparatively unbiased alternative to a narrative review (Niazi, 2015), following the staged process laid out by Kitchenham and Charters (2007) and the broader guidance on writing literature reviews provided by Schryen (2015).

Data Sources and Search Strategy

Three databases were searched: Scopus, Web of Science and Google Scholar. Scopus was chosen for the breadth of its citation and abstract coverage, and Web of Science for its strong coverage of management-focused outlets; together the two databases are considered adequate for a review of this kind (Azad & Hyrnsalmi, 2023). Google Scholar was used to cross-check completeness and to locate further articles through author and bibliography (“snowball”) searching. Because “megaproject” has no single agreed definition, and because researchers also use terms such as “major project,” “large project” or “complex program” (Zhou & Mi, 2017), the search string combined a family of size/complexity terms — major project, large project, large-scale project, complex project, complex program, giga project, giant project — with a family of performance terms — failure, poor performance, collapse, incomplete, disruption — joined with Boolean AND/OR logic and adapted to the syntax of each database.

Eligibility Criteria

Studies qualified for inclusion if they:

- ▶ were published in English;
- ▶ were available in full text;
- ▶ appeared between 2014 and 2024;
- ▶ dealt with megaprojects in any industry sector;
- ▶ were peer-reviewed journal articles; and
- ▶ cleared the rigour, significance and reliability thresholds of the quality-appraisal process described below.

Studies were excluded if they were duplicate records, not published in English, or if they were books, book chapters, company or grey-literature sources, or unpublished theses.

Search Execution

An initial Google Scholar search within the specified date range returned 3,569 records. Narrowing this to articles with the key terms in the title cut the set down to 54 records. Screening the abstracts and introductions of those 54 articles for direct relevance to megaproject failure and performance reduced the pool to 43 articles, of which 37 were retrievable in full text and satisfied all eligibility and quality criteria; these 37 articles make up the evidence base for this review (the complete list appears in the original dissertation from which this article is derived). This screening sequence follows a conventional PRISMA-style identification → screening → eligibility → inclusion flow, moving from 3,569 identified records down to 37 included studies.

Quality Appraisal

Included studies were appraised using the Critical Appraisal Skills Program (CASP) framework (Horsley et al., 2011). Three screening questions covered the reliability, rigour and significance of each study's findings; any study failing one of these was excluded outright. A further ten questions, adapted from Mnqonywa (2017), assessed each study's relevance in more depth, with responses scored as “yes” (1), “partially defined” (0.5) or “not well defined” (0); inclusion required a composite score of at least 5, and ideally 7–8. Reliability and trustworthiness were further supported through supervisor review of the screening and analysis process (Kornbluh, 2015).

Data Analysis

Given the qualitative nature of the review, thematic analysis (Braun & Clarke, 2014) was used to code, organize and interpret the findings of the 37 included studies into major themes and sub-themes relevant to the two research questions. This allowed the causes of poor performance and their corresponding management strategies to be grouped into a manageable set of overarching themes, which are presented in Section 4.

Results

This section opens with a profile of the 37 studies included in the review, then reports the thematic findings addressing RQ1 (causes of poor megaproject performance) and RQ2 (strategies for managing that poor performance).

Descriptive Profile of the Reviewed Literature

The included studies were spread across sixteen journals, most often the International Journal of Project Management (9 articles) and the Journal of Management in Engineering (6 articles); the great majority of source journals are indexed in both Scopus and Web of Science. Publication years covered the full 2014–2024 search window, with the largest single-year cluster (11 articles) appearing in 2014 and a smaller but steady stream of more recent studies through 2021–2023 — indicating that the review draws on both foundational and comparatively current evidence. Methodologically, the sample is varied: literature-based studies (e.g., Ahern et al., 2014; Flyvbjerg, 2014; Love et al., 2016), single- and multi-case studies (e.g., Davies et al., 2016; Turner and Xue, 2018), surveys and questionnaires (e.g., Wang & Pitsis, 2020; Wang, 2022), and smaller numbers of focus-group, Delphi and statistical studies (Ansar et al., 2014) all feature. Geographic coverage is similarly broad, spanning China, the United Kingdom, Australia, the Netherlands, several Nordic and Southern European countries, and a number of studies with explicitly global scope — together allowing the thematic synthesis below to draw on evidence from a wide range of institutional and sectoral settings rather than a single national context.

Causes of Poor Megaproject Performance (RQ1)

Table 1 summarizes the seven themes into which the causes of poor megaproject performance, as identified across the 37 reviewed studies, can be grouped.

Table 1

Causes of Poor Megaproject Performance Identified in the Reviewed Literature

Theme	Description	Representative sources
Project planning and governance	Traditional, linear planning styles, weak front-end definition, and formal/informal governance structures that are poorly balanced.	Ahern et al. (2014); Chen and Manley (2014); Guo et al. (2014); Klakegg et al. (2016); Love et al. (2017)
Cost and budget management	Overly optimistic budgets, thin cost-contingency planning, poorly controlled change orders, and errors or omissions in estimating.	Ansar et al. (2014); Baccarini and Love (2014); Love et al. (2016, 2017); Turner and Xue (2018)
Project complexity	Technological, informational, organisational and goal-related complexity interacting in ways that are hard to fully anticipate.	Luo et al. (2017); Locatelli et al. (2017); Davies et al. (2016); Müller-Mahn et al. (2021)
External factors	Political polarization, economic conflict, regulatory gaps and climate-related pressure sit outside the project's direct control.	Marshall and Cowell (2016); Wang and Pitsis (2020); Wang (2022)
Risk and uncertainty	Dependence on unproven or novel technology, paired with weak mechanisms for spotting and pricing risk during design and delivery.	de Bruin et al. (2014); Turner et al. (2008); Locatelli et al. (2014); Boateng et al. (2015)
Stakeholder management	Fragmented, owner-centric industry structures, stakeholders under political pressure, and interests that are poorly understood.	Ninan et al. (2021); Olatunji (2018); Shenoy and Mahanty (2021); van Fenema et al. (2016)
Leadership and team capability	Weak or missing project leadership, an unhealthy organizational culture, and incentives that pull individuals away from project goals.	Wang and Pitsis (2020); Turner et al. (2008)

Taken together, these seven themes do not operate in isolation. Weak front-end planning and governance (Ahern et al., 2014; Chen & Manley, 2014) tend to generate biased budgets and inadequate cost-contingency provision (Ansar et al., 2014; Baccarini & Love, 2014), which then interact with the technological, informational and organizational complexity inherent to megaprojects (Luo et al., 2017; Locatelli et al., 2017) to magnify the effects of external political and economic shocks (Marshall & Cowell, 2016; Wang & Pitsis, 2020). Novel or unproven technology further compounds risk and uncertainty by lengthening design and development timelines (de Bruin et al., 2014; Turner et al., 2008), while fragmented and politically impatient stakeholder environments (Ninan et al., 2021; Olatunji, 2018; Shenoy & Mahanty, 2021) make it harder to mount a coordinated response to these compounding pressures. Underlying all six of these themes is the seventh: without empowered, capable leadership and teams able to align organizational culture around a shared purpose, the other six causes tend to reinforce each other rather than cancel out (Wang & Pitsis, 2020).

Strategies for Managing Poor Megaproject Performance (RQ2)

For each of the seven causal themes above, the reviewed literature also proposes a corresponding set of management strategies. Table 2 brings these strategies together.

Table 2

Strategies for Managing Poor Megaproject Performance, Mapped to Causal Themes

Causal theme	Key strategies	Representative sources
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Planning and governance	Set project scope clearly from the start; build a system-based governance structure that spans the full delivery chain; keep governance adaptable across the project life cycle; back up formal governance with informal collaboration mechanisms.	Locatelli et al. (2014); Klakegg et al. (2016); Guo et al. (2014); van Fenema et al. (2016); Patanakul et al. (2016); Chen and Manley (2014)
Cost and budget management	Keep engineering and cost-control functions continuously involved in tracking scope, schedule and cost deviations; adopt compliant IT/reporting systems; put cost data to active use in decision-making; gauge the likely scale of change orders before they escalate.	Baccarini and Love (2014); Locatelli et al. (2014); Turner et al. (2008); Turner and Xue (2018); Love et al. (2016, 2017)
Project complexity	Break the project into manageable, parallelizable units through modularization; favor mutual-adjustment mechanisms over trying to fully specify the project up front; simplify wherever possible to keep risk identification manageable; maintain a consistent, structure-aware information system.	Ansar et al. (2014); Shenoy and Mahanty (2021); Patanakul et al. (2016); Ahern et al. (2014); Love et al. (2016); Boateng et al. (2015); Müller-Mahn et al. (2021); Turner and Xue (2018)
External factors	Explicitly assess the political landscape and government incentives; embed the project within the relevant institutional structure; use well-specified contracts and robust change-management procedures; build adaptable procurement approaches; integrate internal, external and inter-organizational system design; weigh economic, social and environmental consequences together.	Marshall and Cowell (2016); Flyvbjerg (2014); Patanakul et al. (2016); Müller-Mahn et al. (2021); Love et al. (2017); Ninan et al. (2021); Locatelli et al. (2017); Wang (2022)
Risk and uncertainty	Build explicit contingency plans for a complex, constantly shifting system; balance exploiting existing knowledge with exploring new approaches; invest early in bias-checking tools and procedures; strengthen communication through integrated information and digital-modelling systems; balance flexibility with control; keep design options open until the last responsible moment.	de Bruin et al. (2014); Davies et al. (2016); Turner et al. (2008); Flyvbjerg (2014); Luo et al. (2017); Szentes and Eriksson (2016); Olatunji (2018); Wang (2022); Shenoy and Mahanty (2021)
Stakeholder management	Keep promoter and provider roles complementary rather than adversarial; define project scope clearly for all stakeholders; set up independent, well-informed governance for sponsor, client, owner and operator roles; tailor engagement to each stakeholder's interests and influence; hold regular senior-level one-on-one meetings; give stakeholders room to adapt to unforeseen circumstances.	Wang and Pitsis (2020); Love et al. (2017); Ninan et al. (2021); Wang (2022); Szentes and Eriksson (2016); Patanakul et al. (2016); van Fenema et al. (2016)
Leadership and team capability	Put empowered, dedicated leaders in charge of the project and its sub-projects; invest in training and development at the individual, team and organizational level; treat megaprojects as collaborative partnerships rather than strict hierarchies; make sure leaders deeply understand implementation processes; cultivate strategic thinking, foresight and interpersonal skills.	Wang and Pitsis (2020); Klakegg et al. (2016); Wang (2022); Olatunji (2018)

Two patterns emerge across Table 2. First, the strategies proposed for structural or technical themes — planning and governance, cost management, and complexity — converge on a similar logic: define what can be defined early,

but build in explicit mechanisms (informal governance, mutual adjustment, modular structuring) for handling what cannot. Second, the strategies proposed for the more relational themes — external factors, stakeholder management, and leadership — converge on a logic of proactive engagement and flexibility rather than control: assessing the political and institutional environment early, tailoring communication to specific stakeholders, and empowering rather than merely directing project teams. Risk and uncertainty management sits between these two logics, pairing technical tools (bias-checking, digital information systems) with the same emphasis on flexibility (keeping design options open, balancing exploitation and exploration) found among the relational themes.

Discussion

This review set out to draw together what the last decade of literature says about why megaprojects underperform and what can be done about it. The findings confirm that no single factor drives megaproject failure; rather, poor performance grows out of the interaction between planning, financial, technical, political, risk-related, stakeholder-related and human factors — echoing Flyvbjerg's (2014) observation that megaproject performance has stayed persistently poor across seventy years of comparable data. Each of the seven themes identified in Section 4 is discussed below against the wider literature.

Planning and governance emerged as the most frequently cited cause of underperformance. Flyvbjerg (2014) traces much of this to planners' cognitive and political biases, which produce over-optimistic forecasts systematically; this fits with scope clarity and Locatelli et al.'s (2014) call for stronger governance structures.

Cost and budget considerations proved similarly prominent. Ansar et al. (2014) offer some of the most influential evidence on systematic cost underestimation, a pattern Doloi (2013) links to how (or whether) stakeholders are engaged in cost governance, and which Andersen et al. (2016) attribute partly to weak estimation methods and poor-quality baseline information. Love et al.'s (2016, 2017) work on change-order control adds a delivery-stage dimension to this front-end story. Together, these strands suggest cost overrun is a multi-causal problem that front-end estimation reform alone will not solve; a combined approach, including the cost-control practices described by Baccarini and Love (2014) and Turner et al. (2008), looks more promising.

Project complexity emerged as the third recurring theme, in line with Luo et al.'s (2017) quantitative treatment of megaproject complexity and Ma and Fu's (2020) finding that different dimensions of complexity affect project success in different ways. Davies et al. (2016) likewise stress that the many interacting facets of complexity call for correspondingly multi-faceted management responses tied to manager competence (Damayanti et al., 2021; Mohseni et al., 2019). The modularization strategies advocated by Shenoy and Mahanty (2021) and the mutual-adjustment approach favored by Ahern et al. (2014) represent two complementary, rather than competing, responses to this complexity.

External factors made up a fourth theme. Marshall and Cowell's (2016) account of political influence aligns with Kassem et al.'s (2020) finding that economic, political and security-related risks materially affect megaproject success, and with He et al. (2022) observation that government and public support, technological maturity and organizational reputation all shape outcomes. Taken together, this evidence supports carrying out proactive external-risk assessment during planning — for example through the political-risk screening and the well-defined contracting approach proposed by Love et al. (2017), rather than treating external shocks as purely unforeseeable events.

Fifth, the ability to adapt to unpredictable conditions is itself constrained by early, often irreversible decisions on funding, legal structure, design and contracting (Szentcs & Eriksson, 2016). Because information asymmetry and

unproven technology intensify these risks (Turner et al., 2008; Wang & Pitsis, 2020), several reviewed studies advocate flexible procurement as one practical way of preserving adaptive capacity.

Sixth, effective stakeholder management is consistently identified as a success factor, echoing van Fenema et al. (2016) and Patanakul et al. (2016) on the need to navigate divergent stakeholder interests. Oyeyipo et al. (2019) show that failing to meet stakeholder needs directly produces delay and cost escalation — reinforcing the case for the structured stakeholder-engagement approaches proposed by Patanakul et al. (2016) and Wang (2022).

Finally, this review highlights the importance of strong leadership and capable teams (Wang & Pitsis, 2020). Turner et al. (2008) link project outcomes directly to an organization's collective knowledge and its people's ability to apply it, while Shenoy and Mahanty (2021) note that poor staff retention erodes exactly this capacity over time; Olatunji (2018) frames the resulting skills gap as a structural barrier to delivering the transformation megaprojects demand at every stage. Investing in leadership development and cultivating a genuinely cooperative project culture therefore surfaces repeatedly as a lever for improving outcomes across the other six themes.

Situating the Findings Within More Recent Reviews

Because the underlying dataset for this review was bounded at 2024, it is worth briefly checking the seven-theme structure reported here against subsequent large-scale reviews of the same field.

Denicol, Davies and Krystallis's (2020) systematic review of the megaproject literature; the largest review of the field to date, screening more than 6,000 records, independently identified six comparable themes (decision-making behavior; strategy, governance and procurement; risk and uncertainty; leadership and capable teams; stakeholder engagement; and supply-chain integration and coordination) and concluded that no single theme dominates; a conclusion that closely mirrors the multi-causal picture reported in Section 4 above. More recent thematic reviews reinforce specific strands of this synthesis: Han, Yang and Tian's (2024) review links megaproject governance and delivery quality to broader “high-quality development” outcomes across economic, social, environmental, innovation and safety dimensions, extending the governance and external-factors themes identified here; Sekasi, et al. (2024) review of transport megaprojects in Africa similarly finds that weaknesses in project governance and conceptual definition, rather than technical execution alone, remain the dominant driver of poor performance, corroborating the planning-and-governance theme as the most consistently cited cause of underperformance across contexts and time periods. Taken together, these more recent syntheses suggest that the seven-theme structure identified in this review has held up reasonably well in the years since the underlying literature was compiled, even as new sub-topics, such as supply-chain integration and the link between megaprojects and sustainable, high-quality development, have gained prominence.

Conclusion

Megaprojects carry enormous potential to drive economic development, yet they remain highly prone to underperformance. This review analyzed 37 peer-reviewed studies published between 2014 and 2024 to identify the causes of that underperformance and the strategies proposed to address it. The analysis points to seven interacting causal themes — planning and governance, cost and budget management, complexity, external factors, risk and uncertainty, stakeholder management, and leadership and team capability; and pairs each with a corresponding set of evidence-based strategies. Beyond cataloguing problems, this review's central contribution is to show how these themes interlock: weak governance amplifies cost risk, complexity magnifies exposure to external shocks, and — running through all of the above — leadership and stakeholder engagement determine whether the other technical

and procedural fixes are actually put into practice. This relational emphasis sets the present synthesis apart from accounts that treat megaproject failure as a purely technical or purely financial problem.

Theoretical and Practical Implications

Theoretically, the seven-theme structure offered here provides a compact organizing framework that later empirical and case-based studies can test, refine or extend — for instance by examining how the themes interact within a single project's life cycle rather than treating them as independent variables. Practically, the strategy tables in Section 4 give project sponsors, governance boards and practicing project managers a reasonably comprehensive checklist for auditing their own megaproject arrangements, covering front-end planning, cost governance, complexity management, external-risk assessment, risk and uncertainty planning, stakeholder engagement, and leadership development.

Limitations

As with any systematic review, this study carries several limitations. First, because it synthesizes published research, it is potentially subject to publication bias, since studies reporting successful or informative findings are more likely to be published than those reporting purely negative results, which may understate how common megaproject failure really is. Second, megaprojects vary widely in objective, sector and context, and this variation limits how cleanly findings can be compared or pooled across studies. Third, the completeness of the review depends on the databases, search terms and inclusion criteria used; despite a systematic multi-database search strategy, some relevant studies, particularly those published outside peer-reviewed English-language journals, may have been missed.

Future Research Directions

Future research could usefully move beyond literature synthesis toward primary data collection: case-study or survey-based designs that examine these seven themes directly with megaproject stakeholders would help validate and refine the framework proposed here. Sector-specific comparisons, for instance, contrasting infrastructure and energy megaprojects, or public- and privately financed projects, would help clarify which strategies generalize across contexts and which are sector-dependent. Given the growing emphasis in the post-2024 literature on multi-tier supply-chain complexity and resilience, and on linking megaproject delivery to sustainability and “high-quality development” outcomes (Han et al., 2024), these two areas in particular look ripe for further empirical work. By continuing to identify the underlying causes of underperformance and by systematically testing the strategies proposed to address them, researchers and practitioners can together improve the odds that megaprojects deliver the lasting societal and economic benefits they are meant to provide.

References

- Ahern, T., Leavy, B., & Byrne, P. (2014). Complex project management as complex problem solving: A distributed knowledge management perspective. *International Journal of Project Management*, 32(8), 1371-1381. <https://doi.org/10.1016/j.ijproman.2013.06.007>
- Altshuler, A. A., & Luberoff, D. E. (2004). *Mega-projects: The changing politics of urban public investment*. Rowman & Littlefield.
- Andersen, B., Samset, K., & Welde, M. (2016). Low estimates – high stakes: Underestimation of costs at the front-end of projects. *International Journal of Managing Projects in Business*, 9(1), 171-193. <https://doi.org/10.1108/ijmpb-01-2015-0008>
- Ansar, A., Flyvbjerg, B., Budzier, A., & Lunn, D. (2014). Should we build more large dams? The actual costs of hydropower megaproject development. *Energy Policy*, 69, 43-56. <https://doi.org/10.1016/j.enpol.2013.10.069>
- Azad, N., & Hyrinsalmi, S. (2023). DevOps critical success factors — A systematic literature review. *Information and Software Technology*, 157, 107150. <https://doi.org/10.1016/j.infsof.2023.107150>
- Baccarini, D., & Love, P. E. (2014). Statistical characteristics of cost contingency in water infrastructure projects. *Journal of Construction Engineering and Management*, 140(3). [https://doi.org/10.1061/\(asce\)co.1943-7862.0000820](https://doi.org/10.1061/(asce)co.1943-7862.0000820)
- Batty, M. (2013). Great planning disasters. In *The planning imagination* (pp. 28–39). Routledge.
- Bell, E., Bryman, A., & Harley, B. (2022). *Business research methods*. Oxford University Press.
- Boateng, P., Chen, Z., & Ogunlana, S. O. (2015). An analytical network process model for risks prioritisation in megaprojects. *International Journal of Project Management*, 33(8), 1795-1811. <https://doi.org/10.1016/j.ijproman.2015.08.007>
- Bovensiepen, J., & Meitzner Yoder, L. S. (2018). Introduction: The political dynamics and social effects of Megaproject development. *The Asia Pacific Journal of Anthropology*, 19(5), 381-394. <https://doi.org/10.1080/14442213.2018.1513553>
- Braun, V., & Clarke, V. (2014). What can “thematic analysis” offer health and wellbeing researchers? *International Journal of Qualitative Studies on Health and Well-being*, 9(1). <https://doi.org/10.3402/qhw.v9.26152>
- Brookes, N., Sage, D., Dainty, A., Locatelli, G., & Whyte, J. (2017). An island of constancy in a sea of change: Rethinking project temporalities with long-term megaprojects. *International Journal of Project Management*, 35(7), 1213-1224. <https://doi.org/10.1016/j.ijproman.2017.05.007>
- Brooks, N. (2015). *Delivering European megaprojects: a guide for policy makers and practitioners*. University of Leeds, Leeds.
- Caldas, C., & Gupta, A. (2017). Critical factors impacting the performance of mega-projects. *Engineering, Construction and Architectural Management*, 24(6), 920-934. <https://doi.org/10.1108/ecam-05-2016-0117>
- Callegari, C., Szklo, A., & Schaeffer, R. (2018). Cost overruns and delays in energy megaprojects: How big is big enough? *Energy Policy*, 114, 211-220. <https://doi.org/10.1016/j.enpol.2017.11.059>
- Chen, L., & Manley, K. (2014). Validation of an instrument to measure governance and performance on collaborative infrastructure projects. *Journal of Construction Engineering and Management*, 140(5). [https://doi.org/10.1061/\(asce\)co.1943-7862.0000834](https://doi.org/10.1061/(asce)co.1943-7862.0000834)
- Crosby, P. (2017). Shaping complex mega-projects: Practical steps for success. *Australian Journal of Civil Engineering*, 15(1), 1-19. <https://doi.org/10.1080/14488353.2017.1362806>

- Damayanti, R., Hartono, B., & Wijaya, A. (2021). Complexity, leadership, and megaproject performance: A configuration analysis. *Journal of Industrial Engineering and Management*, 14(3), 570. <https://doi.org/10.3926/jiem.3476>
- Davies, A., Dodgson, M., & Gann, D. (2016). Dynamic capabilities in complex projects: The case of London Heathrow Terminal 5. *Project Management Journal*, 47(2), 26-46. <https://doi.org/10.1002/pmj.21574>
- De Bruin, K., Goosen, H., Van Ierland, E. C., & Groeneveld, R. A. (2013). Costs and benefits of adapting spatial planning to climate change: Lessons learned from a large-scale urban development project in The Netherlands. *Regional Environmental Change*, 14(3), 1009–1020. <https://doi.org/10.1007/s10113-013-0447-1>
- Denicol, J., Davies, A., & Krystallis, I. (2020). What are the causes and cures of poor Megaproject performance? A systematic literature review and research agenda. *Project Management Journal*, 51(3), 328-345. <https://doi.org/10.1177/8756972819896113>
- Desjardins, J. (2017, January 11). *Nine of the world's largest megaprojects that are under construction*. Business Insider.
- Dobbs, R., Pohl, H., Lin, D., Mischke, J., Garemo, N., Hexter, J., Matzinger, S., Palter, R., & Nanavatty, R. (2013). *Infrastructure productivity: How to save \$1 trillion a year*. McKinsey & Company. <https://www.mckinsey.com/capabilities/operations/our-insights/infrastructure-productivity>
- Doloi, H. (2013). Cost overruns and failure in project management: Understanding the roles of key stakeholders in construction projects. *Journal of Construction Engineering and Management*, 139(3), 267-279. [https://doi.org/10.1061/\(asce\)co.1943-7862.0000621](https://doi.org/10.1061/(asce)co.1943-7862.0000621)
- Erol, H., Dikmen, I., Atasoy, G., & Birgonul, M. T. (2018, November). Contemporary issues in mega construction projects. In *Proceedings of the 5th International Project and Construction Management Conference (IPCMC 2018)* (pp. 16–18). Nicosia, Cyprus.
- Eweje, J., Turner, R., & Müller, R. (2012). Maximizing strategic value from megaprojects: The influence of information-feed on decision-making by the project manager. *International Journal of Project Management*, 30(6), 639-651. <https://doi.org/10.1016/j.ijproman.2012.01.004>
- Flyvbjerg, B. (2017). Introduction: The iron law of megaproject management. In *The Oxford handbook of megaproject management* (pp. 1–18). Oxford University Press.
- Flyvbjerg, B. (2014). What you should know about Megaprojects and why: An overview. *Project Management Journal*, 45(2), 6-19. <https://doi.org/10.1002/pmj.21409>
- Frey, T. (2017). *Megaprojects set to explode to 24% of global GDP within a decade*. Future Constr, 10.
- Garemo, N., Matzinger, S., & Palter, R. (2015). Megaprojects: The good, the bad, and the better. *McKinsey & Company*, 1. <https://ktproject.ca/wp-content/uploads/2026/03/Megaprojects-The-good-bad-and-better.pdf>
- Gellert, P. K., & Lynch, B. D. (2003). Mega-projects as displacements. *International Social Science Journal*, 55(175), 15-25. <https://doi.org/10.1111/1468-2451.5501002>
- Guo, F., Chang-Richards, Y., Wilkinson, S., & Li, T. C. (2014). Effects of project governance structures on the management of risks in major infrastructure projects: A comparative analysis. *International Journal of Project Management*, 32(5), 815-826. <https://doi.org/10.1016/j.ijproman.2013.10.001>
- Han, Y., Yang, Q., & Tian, P. (2024). The fundamentals of boosting high-quality development by megaprojects: A systematic literature review. *Project Leadership and Society*, 5, 100140. <https://doi.org/10.1016/j.plas.2024.100140>
- He, Q., Tian, Z., & Wang, T. (2022). Performance measurement methods in megaprojects: An analytical review. *International Journal of Project Management*, 40(6), 634-645. <https://doi.org/10.1016/j.ijproman.2022.05.009>

- Horsley, T., Hyde, C., Santesso, N., Parkes, J., Milne, R., & Stewart, R. (2011). *Teaching critical appraisal skills in healthcare settings*. Cochrane Database of Systematic Reviews. John Wiley & Sons.
- Kardes, I., Ozturk, A., Cavusgil, S. T., & Cavusgil, E. (2013). Managing global megaprojects: Complexity and risk management. *International Business Review*, 22(6), 905-917. <https://doi.org/10.1016/j.ibusrev.2013.01.003>
- Kassem, M. A., Khoiry, M. A., & Hamzah, N. (2020). Assessment of the effect of external risk factors on the success of an oil and gas construction project. *Engineering, Construction and Architectural Management*, 27(9), 2767-2793. <https://doi.org/10.1108/ecam-10-2019-0573>
- Kitchenham, B., & Charters, S. (2007). *Guidelines for performing systematic literature reviews in software engineering*. EBSE Technical Report.
- Klakegg, O. J., Williams, T., & Shiferaw, A. T. (2016). Taming the 'trolls': Major public projects in the making. *International Journal of Project Management*, 34(2), 282-296. <https://doi.org/10.1016/j.ijproman.2015.03.008>
- Kornbluh, M. (2015). Combatting challenges to establishing trustworthiness in qualitative research. *Qualitative Research in Psychology*, 12(4), 397-414. <https://doi.org/10.1080/14780887.2015.1021941>
- Kundu, O., James, A. D., & Rigby, J. (2023). Public opinion on megaprojects over time: Findings from four megaprojects in the UK. *Public Management Review*, 25(6), 1015-1038. <https://doi.org/10.1080/14719037.2021.2003107>
- Lenfle, S., & Loch, C. (2017). Has megaproject management lost its way. In *The Oxford handbook of megaproject management* (pp. 21-38). Oxford University Press.
- Li, Y., Lu, Y., Cui, Q., & Han, Y. (2019). Organizational behavior in Megaprojects: Integrative review and directions for future research. *Journal of Management in Engineering*, 35(4). [https://doi.org/10.1061/\(asce\)me.1943-5479.0000691](https://doi.org/10.1061/(asce)me.1943-5479.0000691)
- Li, Y., Lu, Y., Taylor, J. E., & Han, Y. (2018). Bibliographic and comparative analyses to explore emerging classic texts in megaproject management. *International Journal of Project Management*, 36(2), 342-361. <https://doi.org/10.1016/j.ijproman.2017.05.008>
- Locatelli, G., Invernizzi, D. C., & Brookes, N. J. (2017). Project characteristics and performance in Europe: An empirical analysis for large transport infrastructure projects. *Transportation research part A: policy and practice*, 98, 108-122. <https://www.sciencedirect.com/science/article/abs/pii/S0965856416300817>
- Locatelli, G., Mancini, M., & Romano, E. (2014). Systems engineering to improve the governance in complex project environments. *International Journal of Project Management*, 32(8), 1395-1410. <https://doi.org/10.1016/j.ijproman.2013.10.007>
- Love, P. E. D., Ika, L., & Sing, C.-P. (2016). *Does the planning fallacy prevail in social infrastructure projects? Empirical evidence and competing explanations*. Transportation Research Part A: Policy and Practice.
- Love, P. E., Sing, M. C., Ika, L. A., & Newton, S. (2017). The cost performance of transportation projects: The fallacy of the Planning Fallacy account. *Transportation Research Part A: Policy and Practice*, 122, 1-20. <https://www.sciencedirect.com/science/article/abs/pii/S0965856418310462>
- Luo, L., He, Q., Xie, J., Yang, D., & Wu, G. (2017). Investigating the relationship between project complexity and success in complex construction projects. *Journal of Management in Engineering*, 33(2). [https://doi.org/10.1061/\(asce\)me.1943-5479.0000471](https://doi.org/10.1061/(asce)me.1943-5479.0000471)
- Ma, L., & Fu, H. (2020). Exploring the influence of project complexity on the mega construction project success: A qualitative comparative analysis (QCA) method. *Engineering, Construction and Architectural Management*, 27(9), 2429-2449. <https://doi.org/10.1108/ecam-12-2019-0679>

- Marshall, T., & Cowell, R. (2016). Infrastructure, planning and the command of time. *Environment and Planning C: Government and Policy*, 34(8), 1843-1866. <https://doi.org/10.1177/0263774X16642768>
- Morrow, E. W. (2011). Industrial megaprojects: Concepts, strategies, and practices for success. John Wiley & Sons.
- Miller, R., & Lessard, D. R. (2001). *The strategic management of large engineering projects: Shaping institutions, risks, and governance*. MIT Press.
- Mirabile, M., Marchal, V., & Baron, R. (2017). *Technical note on estimates of infrastructure investment needs*. OECD.
- Mnqonywa, S. (2017). *A systematic literature review of the agile methodology applied during construction project design*. University of Johannesburg (South Africa).
- Mohseni, M., Tabassi, A. A., Kamal, E. M., Bryde, D. J., & Michaelides, R. (2019). Complexity factors in mega projects: A literature review. *The European Proceedings of Multidisciplinary Sciences*, 2(6), 54-67. <https://doi.org/10.15405/epms.2019.12.6>
- Müller-Mahn, D., Mkutu, K., & Kioko, E. (2021). Megaprojects—mega failures? The politics of aspiration and the transformation of rural Kenya. *The European Journal of Development Research*, 33(4), 1069-1090. <https://doi.org/10.1057/s41287-021-00397-x>
- Niazi, M. (2015). Do systematic literature reviews outperform informal literature reviews in the software engineering domain? An initial case study. *Arabian Journal for Science and Engineering*, 40(3), 845-855. <https://doi.org/10.1007/s13369-015-1586-0>
- Ninan, J., Clegg, S., & Mahalingam, A. (2019). Branding and governmentality for infrastructure megaprojects: The role of social media. *International Journal of Project Management*, 37(1), 59-72. <https://doi.org/10.1016/j.ijproman.2018.10.005>
- Ninan, J., Clegg, S., Burdon, S., & Clay, J. (2021). Overt obstacles and covert causes: An exploratory study of poor performance in megaprojects. *Project Leadership and Society*, 2, 100011. <https://doi.org/10.1016/j.plas.2021.100011>
- Oyeyipo, O., Odeyinka, H., Owolabi, J., & Afolabi, A. (2019). Factors inhibiting stakeholder management of mega construction project. *International Journal of Civil Engineering and Technology*, 10(3). <https://ssrn.com/abstract=3456567>
- Patanakul, P., Kwak, Y. H., Zwikael, O., & Liu, M. (2016). What impacts the performance of large-scale government projects? *International Journal of Project Management*, 34(3), 452-466. <https://doi.org/10.1016/j.ijproman.2015.12.001>
- Pitsis, A., Clegg, S., Freeder, D., Sankaran, S., & Burdon, S. (2018). Megaprojects redefined – complexity vs cost and social imperatives. *International Journal of Managing Projects in Business*, 11(1), 7-34. <https://doi.org/10.1108/ijmpb-07-2017-0080>
- Pollack, J., Biesenthal, C., Sankaran, S., & Clegg, S. (2018). Classics in megaproject management: A structured analysis of three major works. *International Journal of Project Management*, 36(2), 372-384. <https://doi.org/10.1016/j.ijproman.2017.01.003>
- Priemus, H., & van Wee, B. (Eds.). (2013). *International handbook on mega-projects*. Edward Elgar Publishing.
- Remington, K., & Pollack, J. (2016). *Tools for complex projects*. Routledge.
- Rezvani, A., & Khosravi, P. (2018). A comprehensive assessment of project success within various large projects. *The Journal of Modern Project Management*, 6(1). <https://journalmodernpm.com/manuscript/index.php/jmpm/article/view/JMPM01613>
- Schryen, G. (2015). Writing qualitative IS literature reviews—Guidelines for synthesis, interpretation, and guidance of research. *Communications of the Association for Information Systems*, 37. <https://doi.org/10.17705/1cais.03712>

- Sekasi, J., Harrod, S., Andrade, V., & Madsen, J. H. (2024). Performance controls and accountability in African transport infrastructure megaprojects: A systematic literature review. *Project Leadership and Society*, 5, 100123. <https://doi.org/10.1016/j.plas.2024.100123>
- Shenoy, D., & Mahanty, B. (2021). Measuring the readiness of a megaproject. *International Journal of Managing Projects in Business*, 14(4), 999-1022. <https://doi.org/10.1108/ijmpb-05-2020-0154>
- Siemiatycki, M. (2017). Cycles in megaproject development. In *The Oxford handbook of megaproject management* (p. 39). Oxford University Press.
- Söderlund, J., Sankaran, S., & Biesenthal, C. (2017). The past and present of Megaprojects. *Project Management Journal*, 48(6), 5-16. <https://doi.org/10.1177/875697281704800602>
- Szentes, H., & Eriksson, P. E. (2016). Paradoxical organizational tensions between control and flexibility when managing large infrastructure projects. *Journal of Construction Engineering and Management*, 142(4). [https://doi.org/10.1061/\(asce\)co.1943-7862.0001081](https://doi.org/10.1061/(asce)co.1943-7862.0001081)
- Turner, J. R., & Xue, Y. (2018). On the success of megaprojects. *International Journal of Managing Projects in Business*, 11(3), 783-805. <https://doi.org/10.1108/ijmpb-06-2017-0062>
- Turner, R., Huemann, M., & Keegan, A. (2008). Human resource management in the project-oriented organization: Employee well-being and ethical treatment. *International Journal of Project Management*, 26(5), 577-585. <https://doi.org/10.1016/j.ijproman.2008.05.005>
- Van Fenema, P. C., Rietjens, S., & Van Baalen, P. (2016). Stability & reconstruction operations as mega projects: Drivers of temporary network effectiveness. *International Journal of Project Management*, 34(5), 839-861. <https://doi.org/10.1016/j.ijproman.2016.03.006>
- Van Marrewijk, A. (2017). The Multivocality of symbols: A longitudinal study of the symbolic dimensions of the high-speed train Megaproject (1995–2015). *Project Management Journal*, 48(6), 47-59. <https://doi.org/10.1177/875697281704800605>
- Vanclay, F. (2016). The potential contribution of social impact assessment to megaproject developments. In *Socioeconomic evaluation of megaprojects* (pp. 199–216). Routledge.
- Veenswijk, M., Marrewijk, A. V., & Boersma, K. (2010). Developing new knowledge in collaborative relationships in megaproject alliances: Organising reflection in the Dutch construction sector. *International Journal of Knowledge Management Studies*, 4(2), 216. <https://doi.org/10.1504/ijkms.2010.030793>
- Wang, A., & Pitsis, T. S. (2020). Identifying the antecedents of megaproject crises in China. *International Journal of Project Management*, 38(6), 327-339. <https://doi.org/10.1016/j.ijproman.2019.05.003>
- Wu, G., Qiang, G., Zuo, J., Zhao, X., & Chang, R. (2018). What are the key indicators of mega sustainable construction projects? —A stakeholder-network perspective. *Sustainability*, 10(8), 2939. <https://doi.org/10.3390/su10082939>
- Wu, G., Zhao, X., & Zuo, J. (2017). Effects of inter-organizational conflicts on construction project added value in China. *International Journal of Conflict Management*, 28(5), 695-723. <https://doi.org/10.1108/ijcma-03-2017-0025>
- Xiaolong, T., Gull, N., Iqbal, S., Asghar, M., Nawaz, A., Albasher, G., Hameed, J., & Maqsoom, A. (2021). Exploring and validating the effects of mega projects on infrastructure development influencing sustainable environment and project management. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.663199>
- Zhou, Z., & Mi, C. (2017). Social responsibility research within the context of megaproject management: Trends, gaps and opportunities. *International Journal of Project Management*, 35(7), 1378-1390. <https://doi.org/10.1016/j.ijproman.2017.02.017>