

The Impact of Agile Project Management on Project Success in Saudi Arabia's Giga-Project Sector

Mukhtar Alkhalifah

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Chapter 1: Introduction

1.1 Research Background

Saudi Arabia's Vision 2030 has pushed the Kingdom's construction sector into a scale and pace of delivery it has never had to handle before. Giga-projects such as NEOM, Red Sea Global, Qiddiya, and Diriyah Gate are all moving forward at once, across different regions, and contract awards across these programmes climbed 20 percent to reach \$196 billion in 2025 alone (Arab News, 2025). Delivery performance has not kept pace. A 2025 study of 222 completed construction projects in Saudi Arabia found that 64 percent ran over schedule and 53 percent went over budget, even where formal project control systems were already in place (Alotaibi et al., 2025). That gap between record investment and persistent overruns suggests the sequential, phase-gated project management approach construction has relied on for decades may not fit an environment where regulations, stakeholder demands, and site conditions keep shifting over a multi-year delivery programme. Agile project management is one alternative. Built around iterative planning, cross-functional collaboration, and continuous adaptation, it has produced measurable results in the sector that developed it.

The Manifesto for Agile Software Development formalized the approach around four priorities: individuals and interactions, working deliverables, customer collaboration, and responsiveness to change, over rigid adherence to a fixed plan (Beck et al., 2001). Research has since examined whether these principles extend beyond software. Conforto et al. (2014) surveyed 19 medium- and large-sized companies and found several agile enablers already present outside software development. Serrador and Pinto (2015) worked from a larger cross-industry sample and found a statistically significant positive relationship between agile use and project success, with the strongest effect on stakeholder satisfaction. Zamil and Alhusban (2025) reviewed 104 studies published between 2006 and 2025 and pulled out five recurring themes: iterative planning, responsiveness to change, stakeholder collaboration, digital facilitation, and sustainability integration. They concluded that agile principles can improve

adaptability, decision-making, and communication on construction projects, although organizational resistance and policy constraints continue to limit adoption.

Saudi Arabia's giga-project construction sector falls outside all of this work. Zamil and Alhusban (2025) were still writing about sustainable construction broadly, not the scale, regulatory density, and multi-stakeholder complexity of a national giga-project programme, and neither Conforto et al.'s (2014) nor Serrador and Pinto's (2015) samples were construction megaprojects to begin with. No study has examined agile adoption inside a giga-project environment itself, or the institutional conditions particular to Saudi Arabia's construction sector. Alotaibi et al. (2025) documented serious project control and delivery weaknesses there, under conventional project management arrangements, but never asked whether agile practices were present or connected to those outcomes. The literature says little about whether these principles hold where a fixed site, layered regulatory approval, and safety codes limit what a project team can change.

Contractors and project management professionals delivering these giga-projects face constant pressure to move faster as contract values and project counts keep climbing (Arab News, 2025), but nothing in the literature tells them which project management approaches improve outcomes at this scale. If giga-project developers and their contracted teams knew whether, and through which specific practices, agile project management relates to project success, that could shape procurement, staffing, and governance decisions instead of resting on the untested assumption that what works in software transfers directly to megaproject construction. The present study examines the relationship between agile project management practices and project success within Saudi Arabia's giga-project construction sector, drawing on the perceptions of project management professionals working within it. Whether that relationship holds is still an open question: it may work the way it does in software and other industries, or the physical and regulatory constraints of megaproject construction may weaken or change it.

1.2 Research Problem

Agile project management practices have been linked to improved project success in software development and in a growing number of other industries. Their relationship to project success within construction megaprojects, and within Saudi Arabia's giga-project sector specifically, remains largely untested.

1.2.1 Theoretical Gaps

Previous research has established that agile project management practices are positively associated with project success in software development and other cross-industry contexts (Conforto et al., 2014; Serrador & Pinto, 2015). How those principles translate to complex physical construction megaprojects is far less clear. Regulatory approvals, safety codes, and fixed site conditions all constrain what a project team can change.

1.2.2 Practical Gaps

Few empirical studies have looked at agile project management adoption, or its relationship to project success, within Saudi Arabia's giga-project construction sector specifically.

1.3 Research Significance

1.3.1 At the Theoretical Level

This study is grounded in agile project management theory as formalized in the Manifesto for Agile Software Development (Beck et al., 2001), and in project success theory as developed through the iron triangle tradition and its extensions (Atkinson, 1999; Pinto & Slevin, 1987). Rather than propose new theory, it tests whether an established one holds up in a setting where it has not yet been tried. Existing cross-industry evidence (Conforto et al., 2014; Serrador & Pinto, 2015) has never been tested against the fixed physical, regulatory, and safety constraints of construction megaprojects. Testing five recognized agile dimensions against project success within Saudi Arabia's giga-project construction sector establishes whether that relationship extends to this setting. The findings would indicate whether agile project management theory generalizes to complex physical construction megaprojects as currently

specified, or whether this sector's fixed constraints mean the theory needs qualifying before it is applied here with confidence.

1.3.2 At the Practical Level

This study also matters to the project management professionals and contractors responsible for delivering Saudi Arabia's giga-projects. Its findings could tell giga-project managers which specific agile practices, among iterative planning, cross-functional collaboration, adaptive scope management, stakeholder collaboration, and continuous improvement, show the strongest association with project success in this sector. That would let implementation effort go where it helps most, rather than adopting agile practices wholesale on the assumption that every dimension transfers equally. Procurement criteria, project governance structures, and training investment for giga-project delivery teams are all plausible applications. The 64 percent time-overrun and 53 percent cost-overrun rates documented by Alotaibi et al. (2025) were measured under conventional project management arrangements. This study can establish whether agile practices and those overrun rates are statistically associated, not whether agile practices would lower them; that link is what would make testing the stronger causal claim worthwhile later.

1.4 Research Questions

Main Research Question

How does Agile Project Management influence Project Success in Saudi Arabia's giga-project construction sector?

Research Sub-questions

SQ1. How does iterative planning relate to project success in Saudi Arabia's giga-project construction sector?

SQ2. What relationship exists between cross-functional collaboration and project success in this sector?

SQ3. How does adaptive/flexible scope management relate to project success in Saudi Arabia's giga-project construction sector?

SQ4. What relationship exists between stakeholder collaboration and project success in this sector?

SQ5. How does continuous improvement relate to project success in Saudi Arabia's giga-project construction sector?

1.5 Research Objectives

1. To examine the current Agile Project Management practices and adoption levels in Saudi Arabia's giga-project construction sector.
2. To identify the key challenges faced in implementing agile project management in this sector.
3. To evaluate the impact of agile project management practices on project success.
4. To propose recommendations for improving agile project management adoption in giga-project construction.
5. To generate insights for future research on agile project management in construction contexts.

1.6 Research Hypotheses

H0 (Null): There is no statistically significant relationship between Agile Project Management Practices and Project Success in Saudi Arabia's giga-project construction sector.

Ha/H1 (Alternative/Directional): There is a statistically significant positive relationship between Agile Project Management Practices and Project Success in Saudi Arabia's giga-project construction sector.

Sub-hypotheses (one per Agile Project Management dimension, corresponding to the arrows in the Research Model in Section 1.7):

H1a. Iterative planning is positively related to project success in Saudi Arabia's giga-project construction sector.

H1b. There is a positive relationship between cross-functional collaboration and project success in Saudi Arabia's giga-project construction sector.

H1c. Adaptive/flexible scope management has a positive relationship with project success in Saudi Arabia's giga-project construction sector.

H1d. Stakeholder collaboration is positively related to project success in Saudi Arabia's giga-project construction sector.

H1e. There is a positive relationship between continuous improvement and project success in Saudi Arabia's giga-project construction sector.

1.7 Research Model

[Figure 1: Conceptual Research Model of Agile Project Management Practices (five dimensions) and Project Success]

As Figure 1 shows, the model has a single independent variable, Agile Project Management Practices, broken into the five dimensions introduced in Section 1.3, and a single dependent variable, Project Success, which remains a single measure. Each of these dimensions links to Project Success through its own hypothesis, H1a through H1e, corresponding to the sub-hypotheses in Section 1.6. The model keeps the five dimensions as separate, parallel predictors rather than combining them into a single composite agile-adoption score, because collapsing them would hide exactly the kind of uneven transfer across dimensions that Section 2.4 identifies as plausible in giga-project construction; testing each dimension on its own preserves the ability to detect that some practices matter more than others in this setting.

1.8 Research Methodology

This study's methodology follows Saunders et al.'s (2019) Research Onion, a framework that works from broad philosophical assumptions at the outer layer down to the specific data collection technique at the core.

Research Philosophy: Positivism. This study adopts a positivist research philosophy (Saunders et al., 2019), which treats agile project management practices and project success as constructs that can be measured objectively rather than interpreted through participants' subjective accounts. Data will be collected as numerical scores on a structured questionnaire. Positivism fits a study concerned with whether a statistical relationship holds across a population, rather than with how individual practitioners experience or make sense of agile practices.

Research Approach: Deductive. The study follows a deductive approach, moving from established theory to specific hypotheses and then to data. The theory reviewed in Section 1.1 and Chapter 2, principally the Agile Manifesto and its associated practices alongside the iron triangle tradition in project success theory, provides the starting point from which the hypotheses in Section 1.6 are derived. Those hypotheses will then be tested against field data in Final Project 2. A deductive approach suits a study that starts from an established theory and tests specific, falsifiable hypotheses drawn from it, rather than one that builds new theory up from open-ended data.

Research Choice: Quantitative. This study adopts a mono-method quantitative choice, using numerical data collected through a single instrument to test the stated hypotheses statistically. A quantitative choice works best for research questions that ask whether a statistical relationship exists between measurable constructs, rather than questions about how or why practitioners experience those constructs.

Research Strategy: Correlational, implemented via Survey. This study follows a correlational research design, which tests whether two variables move together without manipulating either one. The design is implemented through a survey strategy: a questionnaire administered to a sample of the target population. A correlational design is the right choice here because the aim is to establish whether agile practices and project success move together, not to manipulate agile adoption experimentally on live giga-projects, which would be neither ethical nor practical.

Time Horizon: Cross-sectional. Data will be collected at a single point in time rather than across a longer period. A cross-sectional design matches the academic timeline

available for Final Project 2, where a longitudinal design tracking practices and outcomes across multiple giga-project phases would not be feasible.

Data Collection Method: Questionnaire. Data will be collected using a structured, self-administered questionnaire that adapts existing validated instruments rather than newly developed items. The agile project management practices construct will draw on the agile practices measures developed and validated by Conforto et al. (2014), adapted to reference construction delivery activities rather than software development activities. The project success construct will draw on the efficiency (time, cost, scope) and stakeholder success dimensions validated by Serrador and Pinto (2015), consistent with Atkinson's (1999) critique of the iron triangle as an incomplete measure of project success on its own.

[Figure 2: This Study's Path Through Saunders et al.'s (2019) Research Onion]

Figure 2 shows this study's position on each layer of the Research Onion.

Population and sample: the target population for the eventual empirical study is project management professionals working within Saudi Arabia's giga-project construction sector, including client-side project managers, contractor and subcontractor project management staff, and consultants engaged on giga-project developments such as NEOM, Red Sea Global, Qiddiya, and Diriyah Gate. A target sample size of approximately 150 to 200 respondents is proposed. Babyak (2004) notes that for linear models such as multiple regression, a minimum of 10 to 15 observations per predictor variable will generally allow good estimates; with five agile project management dimensions as predictors, a sample in this range provides an adequate ratio for regression-based hypothesis testing while remaining realistic given the size of the accessible population. Actual data collection, sampling, and statistical analysis will take place in Final Project 2; this study is limited to the design of the data collection instrument and the definition of the target population and sample.

1.9 Scope of the Study

Five considerations bound the scope of this study: relevance, access, ethical considerations, representativeness, and resources.

Relevance: Saudi Arabia's giga-project construction sector is a live, large-scale setting in which construction megaprojects are being delivered under exactly the accelerated pace and adaptive-management pressure that motivates the study's research question.

Access: the researcher has realistic access to this population through professional and academic networks connected to Saudi Arabia's construction and project management sector, and through the widespread presence of project management professionals across the Kingdom's giga-project programmes, which collectively employ large numbers of contracted project management staff across multiple firms and disciplines.

Representativeness: that same breadth is what supports representativeness. Project management professionals working across multiple giga-projects and multiple contracting organizations are expected to represent the broader population of construction project management practice in Saudi Arabia's giga-project sector reasonably well, allowing findings to generalize, with appropriate caution, to project management practice within this sector rather than being confined to a single project or organization.

Ethical Considerations: the eventual data collection will observe standard ethical protections for survey research, including voluntary participation, informed consent, anonymity or confidentiality of individual responses, and each participant's right to withdraw.

Resources: the study is designed around a self-administered digital questionnaire distributed through professional networks, an approach the academic timeline for Final Project 2 can accommodate without external funding, paid database access, or in-person data collection across multiple sites.

1.10 The Suggested Project Structure

The full project will comprise five chapters. Chapter 1, Introduction, sets out the research background, problem, significance, questions, objectives, hypotheses, model, methodology, and scope, all presented above. Chapter 2, Literature Review, goes deeper into the independent and dependent variables and how they relate to each other. The remaining three chapters belong to Final Project 2: Chapter 3, Research Methodology,

will detail the questionnaire design, sampling procedure, and data analysis plan; Chapter 4, Statistical Analysis, will present the results once that data is collected and analyzed; and Chapter 5, Findings' Discussion and Conclusion, will interpret those results against the hypotheses and objectives stated here, then draw conclusions and recommendations for the sector.

1.11 Definition of Terms

The following terms are used throughout this proposal in the specific senses set out below.

Agile project management: an approach to managing projects that prioritizes iterative delivery, close collaboration, and adaptation to changing requirements over rigid adherence to an initial plan (Beck et al., 2001; Highsmith, 2004). The term is used here for the practices themselves rather than for any particular branded framework such as Scrum.

Iterative planning: planning and delivering work in short, repeated cycles, with the plan revised at the end of each cycle, rather than fixing a full schedule at the outset (Beck et al., 2001).

Cross-functional collaboration: work carried out by teams whose members hold different areas of expertise and who stay assigned to the project as a unit, rather than passing work between separate departments in sequence (Takeuchi & Nonaka, 1986).

Adaptive scope management: allowing project scope to change during delivery in response to new information, instead of treating the original scope as fixed and routing every change through formal change control (Beck et al., 2001).

Stakeholder collaboration: continuous involvement of the client and other affected parties throughout delivery, rather than consultation confined to defined approval points (Beck et al., 2001).

Continuous improvement: reviewing team performance at regular intervals and adjusting working methods in response (Beck et al., 2001).

Project success: measured in this study in two parts. Efficiency covers delivery against time, cost, and scope targets, the traditional iron triangle criteria (Atkinson, 1999). Stakeholder success covers the satisfaction of the client and other affected parties with the delivered result (Serrador & Pinto, 2015; Shenhar et al., 2001).

Giga-project: one of the large-scale development programmes launched under Saudi Arabia's Vision 2030, including NEOM, Red Sea Global, Qiddiya, and Diriyah Gate. These programmes differ from conventional megaprojects in their scale and in the number of separate contracting organizations involved in delivery.

Project management professional: any person holding a project management role on a giga-project, including client-side project managers, contractor and subcontractor project management staff, and consultants engaged on the programme. The term is not restricted to holders of a formal certification.

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