

Artificial Intelligence Adoption and Project Management Success in the UAE Construction Sector

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Graduation Project - 1

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Chapter 1: Introduction

1.1 Research Background

Construction is one of the largest industries in the world, but it is also one of the least digitized. For decades its output per worker has grown more slowly than in manufacturing or services, and it has not seen the same productivity gains that changed those sectors (Regona et al., 2022). A lot of this comes down to project management. Construction projects are big, and they involve many different stakeholders at once. Even after years of improving project management methods, teams still deal with cost overruns, late schedules, and quality problems (Project Management Institute [PMI], 2021).

Other industries have moved faster. Finance and retail took up digital tools early to stay competitive (Rogers, 2003), while construction has been slow to catch up. AI is now a normal part of automation and decision-making in many fields, but it is only starting to appear in construction work (Abioye et al., 2021). Because of this, more researchers and project managers are turning to AI to try to close the performance gap.

Recent studies point to several ways AI could help. These include machine-learning tools for cost estimation and scheduling, generative design, and computer-vision systems for safety monitoring (Abioye et al., 2021). Most research on technology adoption builds on the Technology Acceptance Model (TAM). Davis (1989) argued that two things decide whether people adopt a new tool: how useful they think it is, and how easy they think it is to use. Venkatesh et al. (2003) later expanded this into the UTAUT framework, which adds social influence and facilitating conditions. Researchers now use both models to study how project-based organizations take up AI.

The existing research still has clear gaps. Most of it is conceptual and focuses on what AI could do, rather than showing that it actually improves project results (Abioye et al., 2021; Regona et al., 2022). The empirical evidence is also mostly from Western markets. The Gulf Cooperation Council (GCC), and the United Arab Emirates (UAE) in particular, has received little attention, even though a lot of construction happens there. Another problem is that adoption theory is rarely tested against the outcomes project managers actually track: cost, schedule, quality, and stakeholder satisfaction. So there is not enough evidence yet to say that adopting AI leads to measurable benefits.

This gap matters even more in the UAE. Construction there is closely tied to large economic plans, from Etihad Rail to Dubai's 2040 Urban Master Plan. In its National Strategy for Artificial Intelligence 2031, the UAE Government (2017) named construction and infrastructure as key areas for AI-driven productivity. On the ground, though, much of the sector still runs on traditional subcontracting and scattered project data. Before PMO leaders and project managers invest heavily in

AI, they need evidence that it pays off. This makes the UAE construction market a useful and under-studied place to test technology-adoption theories.

This study brings together established project success criteria and technology-adoption theory to look at how AI affects project management success in the UAE construction sector.

1.2 Research Problem

TAM (Davis, 1989) and UTAUT (Venkatesh et al., 2003) were built for stable office settings. Construction projects are different. They are temporary, often disorganized, and involve many stakeholders. In construction, simply using a piece of software does not mean the project succeeded. Success is usually judged by cost, schedule, quality, and stakeholder satisfaction (PMI, 2021). Adoption theories, though, rarely test their main ideas, such as perceived usefulness, against these kinds of project outcomes.

In practice, UAE construction firms have very little to guide their AI investment decisions. Vendors and industry blogs advertise big efficiency gains, but there is almost no independent, peer-reviewed evidence that AI actually improves construction outcomes in the UAE (Regona et al., 2022).

This leaves one main question unanswered: to what extent does AI adoption actually affect project management success in the UAE construction sector?

1.3 Research Significance

On the theory side, this study applies TAM and UTAUT to project-level outcomes instead of just individual intentions to use a tool (Venkatesh et al., 2003). It also adds empirical data from the UAE, which is useful because most existing studies come from North America, Europe, and East Asia (Abioye et al., 2021; Regona et al., 2022).

On the practical side, the findings can help UAE construction firms make better-informed investment decisions by showing which project management tasks, such as risk monitoring or scheduling, benefit most from AI. Policymakers can also use this sector-specific evidence when designing regulations and incentives for national digital transformation programs.

References

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