AL KUT JOURNAL OF ECONOMIC AND ADMINISTRATIVE SCIENCES
Publisher: College of Economics and Management - Wasit University

The impact of project management tools and techniques on project performance: The mediating role of project planning quality

Mustafa Rahman Hasan[1,2,] * and [3], Amar Hisham Jaaffar [4], Dr. Hussain F. Hasand[5]

[1] Faculty of economic and administration, Wasit university, 52001, Wasit, Iraq

[2] College of Business Management & Accounting (COBA), Universiti Tenaga Nasional (Uniten), Kajang, Selangor MALAYSIA.; mustafa.rahman@uowasit.edu.iq

[3] UNITEN Business School, Universiti Tenaga Nasional (Uniten), Kajang, Selangor MALAYSIA,

ahisham@uniten.edu.my

[5] Dr. Hussain F. Hasan

Hussein.hasan198713@gmail.com

* Correspondence author: mustafa.rahman@uowasit.edu.iq; Lecture, Faculty of economic and administration, Wasit university, Wasit, Iraq

Abstract

This study investigates the impact of project management tools and techniques (PMTT) on the performance of strategic education sector projects in Iraq, with a particular focus on the mediating role of project planning quality. Despite increased investment in educational development, many public projects in Iraq continue to suffer from delays, cost overruns, and underperformance. Using a quantitative, cross-sectional research design, data was collected from 98 professionals involved in educational project implementation. The results show a significant positive relationship between the use of PMTT and project performance. Moreover, project planning quality was found to play a critical mediating role, enhancing the effectiveness of tools in improving project outcomes. The findings suggest that while tools like Gantt charts, risk registers, and scheduling software provide structural support, their success depends largely on how well they are integrated into high-quality planning processes. This study contributes to the literature on project management in post-conflict

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and Technology: The Basic Pillar of Sustainable Development in Iraq)

and developing country contexts and provides practical recommendations for improving public-sector project performance through better planning and tool utilization.

Keywords: Project Management Tools, Project Planning Quality, Project Performance, Education Sector, Iraq, Public Projects, Mediation

1.0 Introduction

In developing countries, education is widely recognized as a cornerstone for long-term socio-economic development, national stability, and human capital enhancement (Nguyen, 2023). In Iraq, where decades of conflict, political instability, and underinvestment have significantly affected educational infrastructure and quality, reforming the education sector has become a top national priority (Al-Zalemy et al., 2019). Strategic education projects such as university expansion programs, digital learning initiatives, and curriculum modernization are being implemented to improve access, quality, and equity in education (Asari et al., 2021).

Despite the high strategic importance and substantial funding allocated to these projects, many faces recurring issues: poor scope definition, delays, resource mismanagement, and failure to deliver expected outcomes (Angrist et al., 2024). These challenges raise critical questions about the adequacy of project management practices used in planning and implementing such reforms (Sospeter et al., 2020).

Project management tools and techniques (PMTT), including project charters, Gantt charts, stakeholder analysis, risk management matrices, and scheduling software, are designed to support systematic project planning and execution (Shah et al., 2023). While these tools are widely adopted in theory, their actual contribution to project success in the education sector remains underexplored—especially in the context of public-sector reform projects in Iraq (Al-Abdali & Alzayadi, 2020).

Recent literature suggests that the effectiveness of these tools is heavily dependent on how well they are applied during the planning phase (Richard & K., 2021). Thus, project planning quality may serve as a key mediator between the use of PM tools and overall project performance (Kiambi & Njeri, 2023). Poorly executed planning, even with advanced tools, can compromise stakeholder alignment, timelines, budgets, and final impact (Féris et al., 2017).

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

This study aims to investigate the impact of project management tools and techniques on the performance of strategic education sector projects in Iraq, with a specific focus on the mediating role of project planning quality. By targeting a high-impact sector, the research contributes to both academic literature and policy discourse, offering practical recommendations for improving project outcomes in educational reform efforts. The study analyses the complex connections between the use of project management tools, the quality of project planning, and the resultant project performance in Iraq's education sector.

The effective integration of strategic planning into educational institutions is important for encouraging improvements in teaching practices and enhancing student learning outcomes (Khan, 2008). Project management, when conceptualized as a technology-driven approach, can be instrumental in steering modern educational organizations toward efficient resource management and goal attainment (Podymova et al., 2020).

1.1 Problem Statement

Strategic education sector projects in Iraq—such as university infrastructure development, e-learning systems, and curriculum reforms—are essential for rebuilding the country's human capital and fostering long-term national development (Mahmood, et al. 2024). Despite significant investments and donor support, many of these projects face delays, cost overruns, poor execution, and failure to achieve intended educational outcomes (Bekheet, et al. 2023).

Project management tools and techniques (PMTT) are designed to improve project coordination, planning, and control (Mamatlepa, M. C., & Mazenda, A., 2024). Yet, their effectiveness in the context of education sector reforms remains unclear. Existing evidence suggests that the mere presence of project management tools does not guarantee improved project performance (Kerzner, H. 2025). Project management: a systems approach to planning, scheduling, and controlling (Kerzner, H. 2025). Project management: a systems approach to planning, scheduling, and controlling (Kerzner, H. 2025). Instead, the quality of project planning may serve as a critical factor that influences how well these tools translate into successful outcomes (Tarawneh, A. 2025).

Currently, there is a research gap in understanding how project planning quality mediates the relationship between the use of project management tools and the performance of education sector projects in Iraq. Without this understanding, project managers and

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and Technology: The Basic Pillar of Sustainable Development in Iraq)

policymakers may continue to invest in tools without optimizing their use during the planning phase, resulting in continued inefficiencies and missed educational goals.

1.2 Research Objectives

1. To examine the extent to which project management tools and techniques are used in strategic education sector projects in Iraq.

2. To assess the impact of project management tools and techniques on project performance.

3. To evaluate the role of project planning quality in mediating the relationship between project management tools and project performance.

4. To provide recommendations for improving planning and performance in the education sector projects through better use of project management tools.

1.3 Research Questions

1. To what extent are project management tools and techniques applied in strategic education sector projects in Iraq?

2. What is the relationship between the use of project management tools and techniques and project performance?

3. How does project planning quality mediate the relationship between project management tools and project performance?

4. What best practices can be recommended to improve project performance through effective planning in the education sector?

1.4 Conceptual Framework

Described in structured text format:

• Independent Variable (IV):

Project Management Tools and Techniques (e.g., Gantt charts, WBS, risk analysis, scheduling tools).

• Mediating Variable:

Project Planning Quality (e.g., clarity of scope, stakeholder involvement, time/cost estimation accuracy).

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

•   Dependent Variable (DV):

Project Performance (e.g., time, cost, scope, quality, satisfaction of educational objectives).
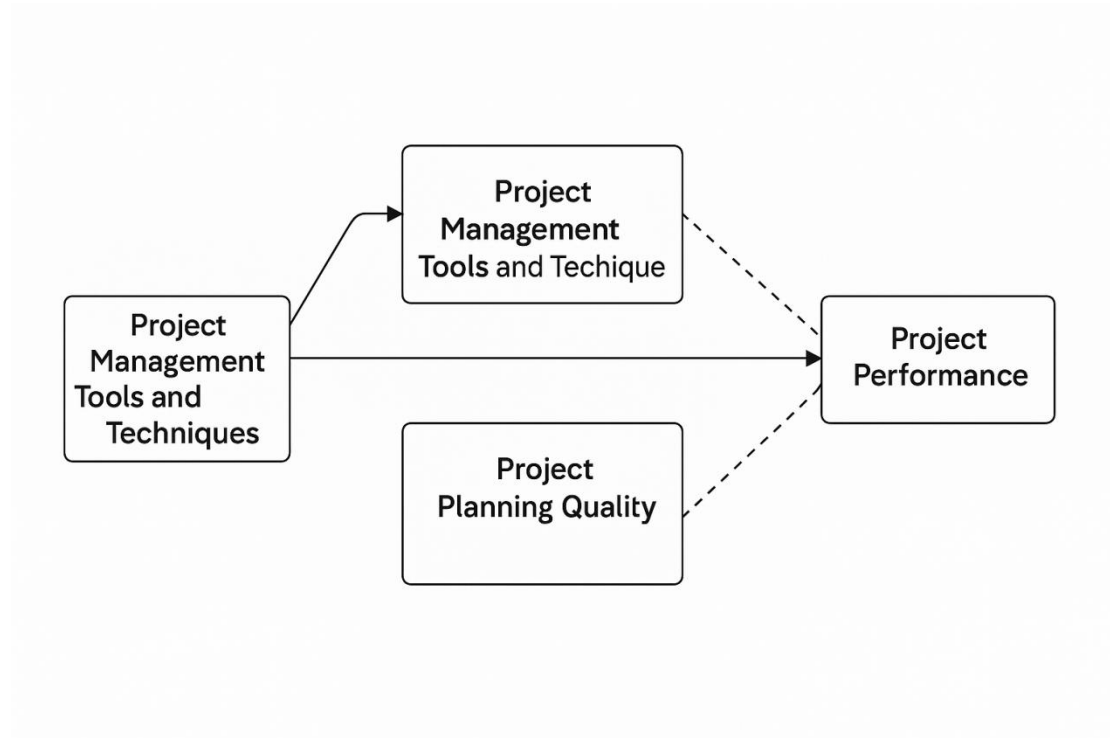
Figure 1. Conceptual Framework

2. Literature Review

2.1 Project Management Tools and Techniques

Project management tools and techniques (PMTT) refer to structured methods, software applications, and frameworks used to guide project planning, execution, and control (PMI, 2021). These include Gantt charts, Work Breakdown Structures (WBS), risk registers, stakeholder analysis matrices, and earned value management, among others. Their application is intended to enhance efficiency, reduce uncertainty, and support decision-making throughout the project lifecycle (Kerzner, 2022).

Numerous studies have underscored the contribution of PMTT to improved project governance and control. For example, Serrador and Turner (2015) found that organizations that systematically applied project management methodologies experienced higher rates of project success across various industries. Similarly, Joslin and Müller (2016) emphasized

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

that adopting formal project management frameworks is positively correlated with strategic alignment and improved resource utilization.

However, while tools offer structure, their actual effectiveness is highly dependent on how they are implemented within specific project environments. In public sector and reform-oriented projects, especially within education—bureaucratic constraints and limited managerial capacity often hinder full adoption and proper use of PMTT (Al-Tameemi & Alshawi, 2019).

2.2 Project Planning Quality

Project planning quality refers to the extent to which the planning phase produces a comprehensive, realistic, and coordinated roadmap for implementation. High-quality planning includes well-defined scope, realistic schedules, accurate resource estimation, and effective stakeholder involvement (Zwikael & Globerson, 2006).

Effective planning serves as a critical foundation for project success. According to Pinto and Slevin (1987), planning is one of the most predictive factors of successful project performance. More recent findings reinforce this view, indicating that quality planning can mitigate many risks, improve coordination, and enhance adaptability during execution (Mir & Pinnington, 2014).

Despite its importance, many public education projects particularly in post-conflict regions suffer from weak planning due to unclear objectives, political interference, and lack of skilled planners (Abbas & Al-Bayati, 2021). As such, the mediating role of planning quality becomes critical: it can amplify the positive effects of PM tools or render them ineffective if inadequately executed.

2.3 Project Performance

Project performance typically encompasses the degree to which a project meets its goals in terms of scope, time, cost, and quality (PMI, 2021). In recent literature, project performance is also increasingly assessed by user satisfaction, strategic alignment, and long-term impact particularly in the public sector and educational reforms (Ika et al., 2012).

Factors influencing performance are multifaceted, but empirical studies consistently identify project planning, stakeholder engagement, and managerial competence as the most influential (Khosravi, Bakar, & Khosravi, 2020). Moreover, there is growing

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

acknowledgment that performance outcomes are not solely dependent on the tools used but also on the processes that translate strategic intent into operational reality (Turner & Zolin, 2012).

In the context of Iraq's education sector, recurring challenges such as resource mismanagement, shifting policy environments, and limited monitoring capacity further complicate the performance equation (Al-Attar & Sweiss, 2020). Therefore, understanding the interplay between PM tools, planning quality, and performance becomes essential for policy reform and effective implementation.

3. Methodology

3.1 Research Design

This study employs a quantitative, cross-sectional survey-based research design to examine the relationship between project management tools and techniques (PMTT), project planning quality, and project performance. A positive research paradigm underpins the design, aiming to test hypotheses using statistical analysis and establish causality between variables. were tested using linear regression analysis.

3.2 Population and Sampling

The target population includes project managers, engineers, administrators, and consultants involved in strategic education sector projects in Iraq, implemented between 2020 and 2025. These projects include university infrastructure development, curriculum reforms, digital education systems, and teacher training initiatives.

A purposive sampling technique was used to ensure the inclusion of respondents with direct project experience. Data was collected through structured questionnaires distributed to staff in ministries, public universities, and development agencies. A total of 261 questionnaires were distributed, and 98 valid responses were collected and used for analysis.

3.3 Data Collection Instrument

The data collection tool was a structured questionnaire, divided into four sections: demographics, use of project management tools and techniques (PMTT), assessment of project planning quality, and evaluation of project performance. All items were measured

using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Items were adapted from validated scales in existing literature.

3.4 Reliability and Validity

The reliability of the instrument was tested using **Cronbach's Alpha** with a pilot sample of 30 participants (excluded from the main sample). Results showed high reliability:

- PMTT: $\alpha = 0.827$

- Project Planning Quality: $\alpha = 0.816$

- Project Performance: $\alpha = 0.794$

- Overall instrument: $\alpha = 0.857$

These values indicate strong internal consistency, satisfying the commonly accepted threshold ($\alpha > 0.7$), and confirming that the instrument is suitable for measuring the intended constructs.

3.5 Variables and Operationalization

The study variables are operationalized as follows:

- Project Management Tools and Techniques (Independent Variable): Frequency and adequacy of PMTT use, such as WBS, Gantt charts, and risk management tools.

- Project Planning Quality (Mediating Variable): Clarity of scope, schedule realism, and stakeholder involvement.

- Project Performance (Dependent Variable): Time, cost, scope, quality, and stakeholder satisfaction.

3.6 Data Analysis Techniques

The data were comprehensively analyzed via SPSS (Version 11.0 for Windows). The study encompassed tabulations of the range and measures of central tendency for each practice.

3.7 Hypotheses

Based on the conceptual model and literature, the following hypotheses were proposed:

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

H1: The use of project management tools and techniques has a positive and significant impact on project performance.

H2: The use of project management tools and techniques has a positive and significant impact on project planning quality.

H3: Project planning quality has a positive and significant impact on project performance.

Table 1. Variables and Operationalization

Variable	Type	Measurement Approach
Project Management Tools and Techniques	Independent Variable	Frequency and adequacy of PMTT use (e.g., WBS, Gantt, risk tools)
Project Planning Quality	Mediating Variable	Clarity of scope, schedule realism, stakeholder involvement
Project Performance	Dependent Variable	Time, cost, scope, quality, and stakeholder satisfaction

3.8 Result

3.8.1 Sample Description

The tables below show the statistical description of the study sample according to demographic factors:

1 .Gender

Table (2) below shows that approximately 57.5% of the total study sample were males, while approximately 42.5% were females.

Table 2. Gender

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

Details	Frequency	Percentage (%)
Male	150	57.5
Female	111	42.5
Total	261	100

2 .Age

Table (3) below shows that 18.8% of the study samples were under the age of 25, 34.9% were between 25 and 35 years old, 31.4% were between 35 and 45 years old, and 14.9% were older than 45.

Table 3. Age

Details	Frequency	Percentage (%)
Less than 25	49	18.8
25 to 35	91	34.9
35 to 45	82	31.4
Over 45	39	14.9
Total	261	100

3. Educational Attainment

Table (4) below shows that 39.5% of the study sample held a Bachelor's degree, 22.6% held a Master's degree, 12.6% held a PhD, and 25.3% had other qualifications.

Table 4. Educational Attainment

Details	Frequency	Percentage (%)

Details	Frequency	Percentage (%)
Bachelor's	103	39.5
Master's	59	22.6
PhD	33	12.6
Other	66	25.3
Total	261	100

4 .Years of Service

Table (5) shows that 18% of the study sample had less than 5 years of service, 31.4% had between 5 and 10 years, 34.9% had between 11 and 15 years, and 15.7% had more than 15 years.

Table 5. Years of Service

Details	Frequency	Percentage (%)
Less than 5 years	47	18
5 to 10 years	82	31.4
11 to 15 years	91	34.9
More than 15 years	41	15.7
Total	261	100

3.8.2 Study Tool

To answer the study's questions and test its hypotheses, the researcher developed a questionnaire consisting of three axes:

1. Project Management Tools and Techniques

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

2. Project Performance

3. Project Planning Quality

3.8.3 Instrument Reliability Testing

Reliability indicates the consistency of the questionnaire, meaning it should yield the same results when repeated with the same sample. The researcher calculated the reliability using Cronbach's Alpha.

Cronbach's Alpha Coefficient:

To assess the reliability of the study instrument, Cronbach's Alpha was used with a pilot sample of 30 participants (excluded from the main sample). Table (7) shows the reliability coefficients.

Table 7. Reliability Coefficients According to Cronbach's Alpha

Variables	Number of Items	Cronbach's Alpha
Axis 1: Project Management Tools	5	0.827
Axis 2: Project Performance	5	0.794
Axis 3: Planning Quality	5	0.816
Total	15	0.857

The above table shows that the total reliability coefficient of the questionnaire was high at 0.857, which indicates a high degree of reliability according to Nunnally's standard (minimum threshold of 0.7). (Nunnally & Bernstein, 1994)

3.9 Data Analysis and Hypothesis Testing

This section presents and analyzes the statistical results aimed at testing the hypotheses regarding the effect of project management tools and techniques on project performance, and the mediating role of project planning quality.

3.9.1 Hypothesis Testing

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

Hypothesis 1: There is a statistically significant relationship between project management tools and techniques and project performance.

Hypothesis 2: There is a statistically significant relationship between project management tools and techniques and planning quality.

Hypothesis 3: There is a statistically significant relationship between planning quality and project performance.

Table 8. Correlation Test Between Variables

Variables	Project Performance	PM Tools & Techniques	Planning Quality
Project Performance	1.000	0.536**	0.680**
PM Tools & Techniques	0.536**	1.000	0.552**
Planning Quality	0.680**	0.552**	1.000

**Statistically significant at a significance level of (0.01)

*Statistically significant at a significance level of (0.05)

The table above shows that the correlation coefficient between the independent variables (project management tools and techniques and quality of project planning) and the dependent variable (project performance) is statistically significant at a significance level of 0.01. This indicates the existence of a correlation, meaning that the more project management tools and techniques are used, the more they lead to improved project performance. It also indicates that the higher the quality of planning, the better the project performance.

Hypothesis 4: There is a significant effect of project management tools and techniques on project performance.

To test the hypothesis, simple linear regression was used.

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

Table 9. Simple linear regression results

Sig.	T	B	Variables
0.000	4.208	1.190	fixed limit
0.000	10.216	0.660	Project management tools and techniques
0.000	probability value	104.374	F-test value
0.284	Adjusted coefficient of determination (R2)	0.287	Coefficient of determination (R2)
	1.527		Durbin-Watson

The results presented in the table above, through the results of the statistical analysis, demonstrate the model's significance. The Sig. (F-statistic) value was less than 0.05 and was 0.000, indicating that the model is valid for testing and its results are reliable. It also appears that the Durbin-Watson value reached 1.527, which is an ideal value, as it lies between 1.5 and 2.5, indicating the absence of autocorrelation and spurious regression in the time series values of the study model. The R-squared value was 0.287, meaning that the explanatory power of the independent variables with the mediating variable is 29%. The Adjusted R-squared value was 0.284, meaning that the independent variables affect the mediating variable by 82%, with the remaining 72% attributed to factors outside the model, in addition to random errors resulting from the accuracy of the sample test, the accuracy of the measurement units, and other factors. Interpretation of the Hypothesis Results

The results of the statistical analysis show that the Sig. value for the independent variable, project management tools and techniques, is less than 0.05, reaching 0.000, indicating a significant positive effect of project management tools and techniques on project performance.

The simple linear regression equation can be represented as follows:

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

$Y = 1.190 - 0.660\ X1$

Where:

Y: Project performance.

X1: Project management tools and techniques.

Hypothesis 5: There is a significant positive effect of project management tools and techniques on the quality of project planning.

To test the hypothesis, simple linear regression was used.

Table 10. Simple linear regression results

Sig.	T	B	Variables
0.000	4.208	1.190	Constant
0.000	10.216	0.660	Planning Quality
0.000	probability value	104.374	F-statistic
0.284	Adjusted coefficient of determination (R2)	0.287	Coefficient of determination (R2)
	1.527		Durbin-Watson

The results presented in the table above, through the results of the statistical analysis, demonstrate the model's significance. The Sig. (F-statistic) value was less than 0.05 and was 0.000, indicating that the model is valid for testing and its results are reliable. It also appears that the Durbin-Watson value reached 1.534, which is an ideal value, as it lies between 1.5 and 2.5, indicating the absence of autocorrelation and spurious regression in the time series values of the study model. The R-squared value was 0.305, meaning that the explanatory power of the independent variables with the mediating variable is 31%. The Adjusted R-

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and Technology: The Basic Pillar of Sustainable Development in Iraq)

squared value was 0.302, meaning that the independent variables affect the mediating variable by 30%, with the remaining 70% attributed to factors outside the model, in addition to random errors resulting from the accuracy of the sample test, the accuracy of the measurement units, and other factors. Interpretation of the Hypothesis Results.

The results of the statistical analysis show that the Sig. value for the independent variable, project management tools and techniques, is less than 0.05, reaching 0.000, indicating a significant positive effect of project management tools and techniques on the quality of project planning.

The simple linear regression equation can be represented as follows:

$Y = 0.712 + 0.754X1$

Where:

Y: Project planning quality.

X1: Project management tools and techniques.

Hypothesis 6: There is a significant positive effect of project planning quality on project performance.

To test the hypothesis, simple linear regression was used.

Table 11. Simple linear regression results

Sig.	T	B	Variables
0.000	9.703	1.614	Constant
0.000	14.929	0.613	Planning Quality
0.000	probability value	222.980	F-statistic
0.460	Adjusted coefficient of determination (R2)	0.463	Coefficient of determination (R2)
1.828		Durbin-Watson	

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and
Technology: The Basic Pillar of Sustainable Development in Iraq)

The results presented in the table above, through the results of the statistical analysis, demonstrate the model's significance. The Sig. (F-statistic) value was less than 0.05 and was 0.000, indicating that the model is valid for testing and its results are reliable. It also appears that the Durbin-Watson value reached 1.828, which is an ideal value, as it lies between 1.5 and 2.5, indicating the absence of autocorrelation and spurious regression in the time series values of the study model. The R-squared value was 0.463, meaning that the explanatory power of the independent variables with the mediating variable is 46%. The Adjusted R-squared value was 0.460, meaning that the independent variables affect the mediating variable by 46%. The remaining 54% is due to factors outside the model, in addition to random errors resulting from the accuracy of the sample test, the accuracy of the measurement units, and other factors. Interpretation of the Hypothesis Result

The results of the statistical analysis show that the Sig. value for the independent variable, project planning quality, is less than 0.05, reaching 0.000, indicating a significant positive effect of project planning quality on project performance.

The simple linear regression equation can be represented as follows:

$Y=1.614+0.613X1$

Where:

Y: Project performance.

X1: Project planning quality.

3.10 Limitations and Implications

The study on strategic education projects in Iraq highlights the importance of project planning quality in influencing project performance. However, the small sample size and purposive sampling strategy may introduce selection bias and limit generalizability. The study is limited to Iraq, a context marked by political instability and post-conflict reconstruction, and its cross-sectional research design may not account for dynamic changes or causal relationships over time. The study also relies on self-reported data, which may introduce biases. The study also lacks long-term performance indicators and does not assess broader organizational, political, or cultural factors. Practical implications include improving the quality of planning activities, investing in training and development, and

Al Kut Journal of Economics and Administrative Sciences /ISSN: 1999 -558X /ISSN Online 2707-4560/ Vol (17) Issue: 58-2025
(August)
Special issue of the proceedings of the international scientific conference entitled (Digital Transformation in the Age of Innovation and Technology: The Basic Pillar of Sustainable Development in Iraq)

mandating planning quality assessments. National-level policies are needed to institutionalize planning standards and tool usage protocols across public-sector projects.

3.11 Recommendations

Future research should focus on planning quality and its impact on project outcomes. It should adopt a longitudinal design, expand the sectoral and geographic scope, incorporate qualitative methods, include additional mediating or moderating variables, evaluate the long-term impact of planning quality and tool use, and develop context-specific frameworks. This will help researchers identify sector-specific success factors, enhance external validity, and develop a more comprehensive model of project performance.

Conclusion

This study set out to examine the impact of project management tools and techniques (PMTT) on project performance within Iraq's strategic education sector, with a particular focus on the mediating role of project planning quality. Drawing on quantitative, cross-sectional design and data collected from 98 professionals involved in public-sector education projects, the research provides valuable empirical insights into how structured project management practices influence implementation outcomes in a complex and post-conflict environment.

The findings confirmed that the use of PMTT—such as Gantt charts, WBS, scheduling software, and risk analysis tools—positively correlates with project performance indicators including time, cost, scope, quality, and stakeholder satisfaction. More importantly, the study demonstrated that project planning quality plays a significant mediating role in this relationship. In other words, tools and techniques only translate into better outcomes when they are applied through high-quality planning processes marked by clear scope definitions, realistic scheduling, accurate resource estimation, and effective stakeholder involvement.

The study also highlighted that, despite the availability of PMTT, many challenges persist in Iraq's public-sector projects due to weaknesses in planning, institutional capacity, and contextual barriers. These findings suggest that focusing solely on tool adoption without addressing the broader planning environment may yield limited improvements in project outcomes.

In conclusion, this research underscores the importance of integrating project management tools with strong planning practices to achieve better performance in educational development projects. It contributes to the literature by providing empirical support for the mediating effect of planning quality and offers practical implications for project managers, policymakers, and development agencies operating in Iraq and similar contexts.

Future research is encouraged to build on these findings by adopting longitudinal and mixed methods approaches, expanding the scope to other sectors or regions, and exploring additional variables that may influence project success in complex environments.

Acknowledgments

Authors' Contributions

Mustafa Rahman initiated the project, conceptualized the research, and completed the research in English. Hussein Falah analyzed the data. Ammar contributed to data collection and supervised the research.

References

Abbas, A. H., & Al-Bayati, A. J. (2021). Challenges facing project implementation in Iraq's education sector. International Journal of Educational Development, 83, 102397. https://doi.org/10.1016/j.ijedudev.2021.102397

Al-Abdali, A. I. E., & Alzayadi, A. D. N. (2020). The electronic approaches: the Era of emergence E-learning in the educational system in Iraq. International Journal of English Literature and Social Sciences, 5(5). https://dx.doi.org/10.22161/ijels.55.12

Al-Attar, A. M., & Sweiss, R. (2020). Factors affecting performance of public sector projects in developing countries: Evidence from Iraq. International Journal of Project Management, 38(5), 341–352. https://doi.org/10.1016/j.ijproman.2019.09.004

Al-Tameemi, K. A., & Alshawi, M. (2019). Barriers to the effective use of project management tools in developing countries: A case of Iraq. Journal of Construction in Developing Countries, 24(1), 17–38.

Angrist, N., Evans, D. K., Filmer, D., Glennerster, R., Rogers, H., & Sabarwal, S. (2024). How to improve education outcomes most efficiently? A review of the evidence using a unified metric. Journal of Development Economics, 103382. https://doi.org/10.1016/j.jdeveco.2024.103382

Asari, H., Neliwati, N., & Hasibuan, A. I. (2021). The Model of Management Quality for Islamic Higher Education: A Case Study at the STIT Al Hikmah Tebing Tinggi. International Journal for Educational and Vocational Studies, 3(3), 196-202.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Bekheet, H. N., Al Sudany, N. K., & Najm, S. S. (2023). Iraqi economy and renewable energy projects between economic necessity and investment challenges. International Journal of Professional Business Review: Int. J. Prof. Bus. Rev., 8(8), 71.

Féris, M. A. A., Zwikael, O., & Gregor, S. (2017). QPLAN: Decision support for evaluating planning quality in software development projects. Decision Support Systems, 96, 92-102. https://doi.org/10.1016/j.dss.2017.02.008

Gladys Sospeter, N., Rwelamila, P. D., & Gimbi, J. (2020). Critical success factors for managing post-disaster reconstruction projects: the case of Angola. Construction Economics and Building, 20(3), 37-55. https://doi.org/10.5130/AJCEB.v20i3.7298

Hadi, A. Z. M. G., Hussien, A. S. A. K., & Falih, B. D. (2019). Strategic Alignment Role in Achieving the Organizational Excellence Through Organizational Dexterity–Analytical Study of the Opinions of a Sample of Professors at Colleges of Karbala University. International Review, (3-4), 11. https://doi.org/10.5937/intrev1903010A

Ika, L. A., Diallo, A., & Thuillier, D. (2012). Critical success factors for World Bank projects: An empirical investigation. International Journal of Project Management, 30(1), 105–116. https://doi.org/10.1016/j.ijproman.2011.03.005

Joslin, R., & Müller, R. (2016). The relationship between project governance and project success. International Journal of Project Management, 34(4), 613–626. https://doi.org/10.1016/j.ijproman.2016.01.008

Kerzner, H. (2022). Project Management: A Systems Approach to Planning, Scheduling, and Controlling (13th ed.). Wiley.

Kerzner, H. (2025). Project management: a systems approach to planning, scheduling, and controlling. John Wiley & Sons.

Khan, D. (2008). Practices of strategic planning in a private secondary school in Karachi (Unpublished master's dissertation). Aga Khan University, Karachi, Pakistan.

Khosravi, P., Bakar, A. H. A., & Khosravi, A. (2020). Performance evaluation in project-based organizations: A literature review. Journal of Project Management, 5(3), 155–170. https://doi.org/10.5267/j.jpm.2019.12.001

Kiambi, L., & Njeri, S. (2023). Influence of Project Funding on Implementation of Government-Funded Projects in Imenti North Sub-County, Meru County. East African Journal of Business and Economics, 6(1), 152-161. https://doi.org/10.37284/eajbe.6.1.1284

Kodi, R. & Kumar, K. M. S. (2021). Contextual analysis of performance appraisal models in HEIs in developed and developing countries–a review of literature. International Journal of Educational Administration and Policy Studies, 13(2), 95-108. https://doi.org/10.5897/IJEAPS2020.0670

Mahmood, M. A., Abedin, B., & Alizadeh, M. (2024). Exploring the Opportunities and Challenges of Higher Education Marketing in Iraq. Pakistan Journal of Life & Social Sciences, 22(2).

Mamatlepa, M. C., & Mazenda, A. (2024). Building project management tools and techniques capacity to drive Information and Communications Technology projects in the Department of Social Development, South Africa. Information Development, 02666669241264740. https://doi.org/10.1177/02666669241264740

Mir, F. A., & Pinnington, A. H. (2014). Exploring the value of project management: Linking project management performance and project success. International Journal of Project Management, 32(2), 202–217. https://doi.org/10.1016/j.ijproman.2013.05.012

Pinto, J. K., & Slevin, D. P. (1987). Critical success factors in effective project implementation. Project Management Journal, 18(3), 67–75.

Podymova, L., Khmelkova, M., Semyonova, M., Golovyatenko, T., & Poliakova, M. (2020). Project Management as a Technology for Managing a Modern Educational Organization. In SHS Web of Conferences (Vol. 79, p. 03006). EDP Sciences. https://doi.org/10.1051/shsconf/20207903006

Project Management Institute (PMI). (2021). A Guide to the Project Management Body of Knowledge (PMBOK Guide) (7th ed.). PMI.

Serrador, P., & Turner, J. R. (2015). The relationship between project success and project efficiency. International Journal of Project Management, 33(7), 1497–1509. https://doi.org/10.1016/j.ijproman.2015.07.006

Shah, F. H., Bhatti, O. S., & Ahmed, S. (2023). A Review of the Effects of Project Management Practices on Cost Overrun in Construction Projects. Engineering Proceedings, 44(1), 1. https://doi.org/10.3390/engproc2023044001

Tarawneh, A. (2025). Efficient Project Management Strategies for Translation Projects: Maximizing Quality and Timeliness in Multilingual Content Creation. In Artificial Intelligence, Sustainable Technologies, and Business Innovation: Opportunities and Challenges of Digital Transformation (pp. 755-764). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-77925-1_66

Trinh, N.T.H. Higher Education and Its Role for National Development. A Research Agenda with Bibliometric Analysis. Interchange 54, 125–143 (2023). https://doi.org/10.1007/s10780-023-09493-9

Turner, J. R., & Zolin, R. (2012). Forecasting success on large projects: Developing reliable scales to predict multiple perspectives by multiple stakeholders over multiple time frames. Project Management Journal, 43(5), 87–99. https://doi.org/10.1002/pmj.21289

Zwikael, O., & Globerson, S. (2006). From critical success factors to critical success processes. International Journal of Production Research, 44(17), 3433–3449. https://doi.org/10.1080/00207540500536972

APPENDIX A

1. Project Management Tools and Techniques (PMTT)

Definition: Structured methods and tools used for planning, executing, and monitoring projects.

Sample Items:

Adapted from PMI (2021), Serrador & Turner (2015)

1.   Our project team consistently uses Gantt charts to monitor timelines.

2.   Risk assessment tools are regularly applied during project planning.

3.   We utilize Work Breakdown Structures (WBS) to define project scope.

4.   Project scheduling software is used to track progress.

5.   Stakeholder analysis is conducted at the beginning of each project.

2. Project Planning Quality

Definition: The comprehensiveness and accuracy of the project planning phase, including clear scope, schedule, and stakeholder involvement. Sample Items:
Adapted from Zwikael & Globerson (2006), Mir & Pinnington (2014)

1. Project objectives and deliverables are clearly defined during planning.

2. Resource requirements are realistically estimated.

3. Time schedules are detailed and achievable.

4. Key stakeholders are actively involved in the planning process.

5. Risk management plans are developed before project execution begins.

3. Project Performance

Definition: The degree to which a project meets its objectives in terms of time, cost, scope, and quality.

Sample Items:

Adapted from Ika et al. (2012), Khosravi et al. (2020)

1.   The project was completed within the scheduled time.

2.   The project was executed within the approved budget.

3.   The project met with all intended deliverables and scope.

4.   Project outcomes met quality standards.

5.   Stakeholders expressed satisfaction with the project results.