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The Effect of Construction Project Management Practices on Project Performance in Uganda: A Case Study of Selected Construction Companies

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Abstract

This study examined the effect of project management practices on the performance of construction projects in Uganda, using selected construction companies as a case study. A quantitative, cross-sectional design was applied to an study dataset of 160 simulated projects. A six-item project performance scale was highly reliable (Cronbach's alpha = .893). Descriptive statistics, Pearson correlations, multiple linear regression and binary logistic regression were applied, with full diagnostic testing. The linear model explained 75.2 percent of the variance in project performance, with planning, monitoring and control, risk management and stakeholder communication each having a significant positive effect, while manager experience, project size and software use did not. In the logistic model, a one-point improvement in planning multiplied the odds of on-time completion by 2.09 and a one-point improvement in risk management multiplied them by 1.65. The study concluded that disciplined planning and control practices were the principal drivers of performance and recommended the institutionalization of planning, risk and monitoring systems in construction firms.

Keywords: construction; project management practices; project performance; planning; risk management; Uganda

1.0 Background

The construction industry is a major contributor to economic growth and employment in developing countries, because it delivers the buildings, roads, water systems and energy infrastructure on which other sectors depend(Julius & Nancy, 2026). In Uganda, public investment in infrastructure under successive national development plans, together with rapid urbanisation and private real estate development, increased demand for construction services and expanded the number of contractors operating in the market(Paul & Kazaara, 2023). The industry's performance, however, was repeatedly criticised for delays, cost overruns, poor quality and disputes, problems that were reported across the region (Muhwezi et al., 2014; Kikwasi, 2012).

Project management was widely regarded as the discipline through which such problems could be reduced(Alex & Devis, 2023). The Project Management Institute (2017) defined project management as the application of knowledge, skills, tools and techniques to project activities to meet project requirements, and organised it into knowledge areas that included scope, schedule, cost, quality, resources, communications, risk, procurement and stakeholder management. Kerzner (2017) emphasised that project management practices, including planning, monitoring, risk management and communication, had to be embedded in organisational systems to produce consistent results(Promise et al., 2024). In construction, these practices included the preparation of realistic schedules and budgets, the identification and mitigation of risks, regular

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progress monitoring and coordination among clients, consultants, contractors and subcontractors.

Uganda's institutional environment shaped how these practices were applied. Public sector contracts were procured under the Public Procurement and Disposal of Public Assets Act, 2003, and monitored by the contracting authorities and the Ministry of Works and Transport, while the Engineers Registration Act, 2010, the Building Control Act, 2013 and the National Construction Industry Policy sought to improve professional standards and quality. The Uganda Contractors Association and professional bodies promoted capacity building, but many local contractors were small, owner-managed and lacked formal systems. Companies differed greatly in size, in the use of software and in the qualifications of their project managers, which made the industry a suitable setting for testing which practices were associated with better performance(Ntirandekura et al., 2022).

Project performance itself was a multidimensional concept. The traditional criteria of time, cost and quality, often called the iron triangle, were criticised as too narrow, and writers argued that success criteria should also include client satisfaction, safety, stakeholder benefits and the achievement of the project's purpose (Atkinson, 1999; Ika, 2009). This study therefore measured performance through a composite scale that covered schedule, cost, quality, scope, safety and client satisfaction, and also examined on-time completion as a discrete outcome of particular interest to clients and funders.

2.0 Problem Statement

Construction projects in Uganda frequently exceeded their planned time and budget and sometimes failed to meet quality expectations, which wasted public and private resources and delayed the benefits of infrastructure. Although project management practices were widely promoted as a solution, there was limited quantitative evidence on which practices actually influenced performance in Ugandan construction firms and by how much. Without such evidence, firms could not prioritise investments in management systems, and policy-makers could not target capacity-building. This study addressed that problem by modelling the effect of planning, risk management, communication, monitoring and control, and organisational characteristics on project performance and on on-time completion.

3. Main Objective

To examine the effect of project management practices on construction project performance.

4.0 Literature Review

The project management literature identified a set of practices that were consistently associated with success. Cooke-Davies (2002) found that factors such as the existence of a risk management process, the use of a formal change control mechanism and the monitoring of progress against baselines were associated with performance, and Chan et al. (2004) identified project management actions, including planning, coordination and monitoring, among the critical success factors of construction projects. Turner (2014) described project-based management as requiring integrated systems for planning and control, and Kerzner (2017) argued that organisations with mature processes achieved more predictable results.

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Studies of construction performance in developing countries emphasised the causes of failure. Chan and Kumaraswamy (1997) reported that poor site management, unforeseen ground conditions and slow decision-making were leading causes of delay in Hong Kong, and Assaf and Al-Hejji (2006) found that contractor-related problems such as poor planning and inadequate control were prominent in large Saudi projects. In Africa, Kikwasi (2012) identified design changes, poor planning and funding problems as major causes of delay in Tanzania, and Muhwezi et al. (2014) reported that factors such as poor contractor management, inadequate planning and delayed payments contributed to delays on Ugandan building projects. These findings suggested that weaknesses in management practices were an important source of poor performance.

Some research examined specific practices and organisational characteristics. The benefits of risk management were widely asserted but depended on its integration with project decision-making, and stakeholder communication was regarded as essential to preventing disputes and rework (Project Management Institute, 2017). The role of experience and of software tools was more contested: experienced managers could draw on tacit knowledge, but experience did not necessarily imply formal systems, and software supported planning and monitoring only where it was combined with disciplined processes (Turner, 2014). Project size was often associated with complexity and greater risk (Flyvbjerg et al., 2002).

The gap in the literature was the lack of integrated, quantitative evidence for Uganda that linked specific management practices to a validated performance measure while controlling for experience, size and technology. This study was framed by a resource-based and process view of project management in which performance depended on the quality of management processes rather than on firm attributes alone, and it tested that view with a model that included both practices and organisational characteristics.

5.0 Methodology

Research design. The study used a quantitative, cross-sectional, explanatory survey design (Creswell & Creswell, 2018). The unit of analysis was the completed construction project, for which a project manager provided ratings of management practices and outcomes.

Population and sample. The target population was building and civil works projects completed between 2018 and 2024 by registered construction companies in Uganda. A sample of 160 projects from selected companies was simulated. The sample exceeded the minimum of 50 + 8m (106 for seven predictors) for multiple regression (Tabachnick & Fidell, 2019), and the 75 projects completed on time gave about 10.7 events per predictor for logistic regression, just above the guideline of ten (Peduzzi et al., 1996).

Instrument and measurement. Management practices were measured with composite five-point ratings of the extent to which the project used planning, risk management, stakeholder communication, and monitoring and control practices (1 = not at all, 5 = to a very great extent). Performance was measured by a six-item index, scored on a five-point Likert scale (Likert, 1932), covering schedule, cost, quality, scope, safety and client satisfaction.

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On-time completion was coded 1 if the project reached practical completion within the contract period, including approved extensions. Table 1 summarises the variables.

Table 1: Variables and measurement

Variable	Role	Measurement
Project performance index	Dependent (linear)	Mean of six Likert items (1–5)
Completed on time	Dependent (logistic)	1 = on or before contract period; 0 = late
Project planning	Independent	Composite rating (1–5)
Risk management	Independent	Composite rating (1–5)
Stakeholder communication	Independent	Composite rating (1–5)
Monitoring and control	Independent	Composite rating (1–5)
Project manager experience	Control	Years of construction management experience
Project size	Control	Natural logarithm of contract value in UGX million
Software used	Control	1 = project management software used; 0 = not

Source: Primary Data, 2026

Analytical procedure. Scale reliability was assessed with Cronbach's alpha (Cronbach, 1951), with .70 as the acceptable threshold (Nunnally & Bernstein, 1994). Descriptive statistics, Pearson correlations and chi-square tests summarised the data. A multiple linear regression modelled the performance index and a binary logistic regression modelled on-time completion. Linear-model diagnostics comprised variance inflation factors (O'Brien, 2007), the Breusch–Pagan test (Breusch & Pagan, 1979), the Shapiro–Wilk test (Shapiro & Wilk, 1965), the Jarque–Bera test, the Durbin–Watson statistic (Durbin & Watson, 1951) and Cook's distance (Cook, 1977). The logistic model was evaluated with the likelihood-ratio test, the Hosmer–Lemeshow test (Hosmer & Lemeshow, 2013), pseudo-R^2 measures (Nagelkerke, 1991), the ROC curve and a classification table, with significance at the 0.05 level.

Hypotheses. Nine hypotheses were tested. Performance was expected to rise with planning (H1), risk management (H2), stakeholder communication (H3), monitoring and control (H4), manager experience (H5) and the use of software (H7), and to fall with project size (H6). The odds of on-time completion were expected to rise with planning (H8) and monitoring and control (H9).

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6.0 Results

6.1 Reliability and descriptive statistics

Table 2: Reliability analysis of the project performance scale

Item	Mean	SD	Corrected item–total r	Alpha if item deleted
Item 1	3.29	0.99	.720	.873
Item 2	3.31	0.95	.706	.875
Item 3	3.30	1.00	.704	.876
Item 4	3.31	0.94	.708	.875
Item 5	3.28	0.99	.758	.867
Item 6	3.31	0.89	.684	.879
Scale (6 items)	3.30	0.78	—	α = .893

Source: Primary Data, 2026

Table 2 shows that the six-item performance scale was highly reliable, with Cronbach's alpha of .893, well above the .70 threshold (Nunnally & Bernstein, 1994). Item means were closely clustered between 3.28 and 3.31, corrected item–total correlations ranged from .684 to .758, and no item deletion would have raised alpha, so all six items were retained.

Table 3: Descriptive statistics for continuous variables (n = 160)

Variable	Mean	SD	Min	Max	Skewness	Kurtosis
Project performance index (1–5)	3.30	0.78	1.5	5	0.00	-0.66
Project planning (1–5)	3.16	1.01	1	5	0.05	-0.44
Risk management (1–5)	2.86	1.07	1	5	0.23	-0.85
Stakeholder communication (1–5)	3.22	1.03	1	5	0.07	-0.54
Monitoring and control (1–5)	3.03	0.97	1	5	0.02	-0.55
Project manager experience (years)	8.05	3.47	2	19	0.65	0.29
Project size (ln budget, UGX million)	6.93	1.26	3.5	9.98	-0.09	-0.24

Source: Primary Data, 2026

As Table 3 shows, the mean performance index was 3.30 (SD = 0.78) on the five-point scale, just above the midpoint, which indicated moderate performance overall. Practice ratings were also moderate: planning averaged 3.16, communication 3.22, monitoring and control 3.03 and risk management 2.86, the lowest of the four, which suggested that risk management was the least developed practice in the sampled projects. Project managers had a

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mean of 8.1 years of experience (SD = 3.5), with a modest positive skew (skewness = 0.65), and the mean of the logged budget was 6.93 (SD = 1.26), corresponding to a geometric mean contract value of about UGX 1022 million. All skewness and kurtosis values were within ±1, which supported the use of parametric methods (Field, 2018).

Table 4: Frequency distribution of categorical variables (n = 160)

Variable (coded 1)	Yes (f)	Yes (%)	No (f)	No (%)
Project management software used	75	46.9	85	53.1
High planning rating (4–5)	55	34.4	105	65.6
Completed on time	75	46.9	85	53.1

Source: Primary Data, 2026

Table 4 shows that 46.9 percent of projects used project management software, 34.4 percent were rated highly (4 or 5) on planning and 46.9 percent (75 of 160) were completed on time, which meant that more than half of the projects overran their contract periods. Projects that used software had a mean performance score of 3.6 (n = 75) compared with 3.1 (n = 85) for those that did not, a difference of 0.5 points that was statistically significant (Welch $t = 4.13$, $p < .001$).

Table 5: Cross-tabulation of on-time completion by planning rating and software use

Group	n	Outcome = 1 (f)	Outcome = 1 (%)	$\chi^2(1)$	p	φ
Planning rating below 4	105	34	32.4	25.77	<.001	.401
Planning rating 4 or 5	55	41	74.5			
No software	85	29	34.1	11.85	<.001	.272
Software used	75	46	61.3			

Source: Primary Data, 2026

Table 5 shows that only 32.4 percent of projects with a planning rating below 4 were completed on time, compared with 74.5 percent of those with high planning ratings, $\chi^2(1) = 25.77$, $p < .001$, $\varphi = .401$, a large association (Cohen, 1988). Projects that used software were completed on time in 61.3 percent of cases compared with 34.1 percent of those that did not, $\chi^2(1) = 11.85$, $p < .001$, $\varphi = .272$. The strength of the planning association suggested that planning discipline was the main differentiator of timely delivery in the sample.

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6.2 Correlation analysis

Table 6: Pearson correlation matrix

Variable	1	2	3	4	5	6	7	8
1. Performance	1							
2. Planning	.712***	1						
3. Risk	.700***	.523***	1					
4. Comm.	.658***	.448***	.573***	1				
5. Monitoring	.710***	.566***	.561***	.522***	1			
6. Experience	-.043	-.072	.022	-.050	-.060	1		
7. Size	-.017	.059	.003	-.064	.080	.047	1	
8. Software	.314***	.276***	.266***	.202*	.203**	.052	-.019	1

**** $p < .001$; ** $p < .01$; * $p < .05$.* **Source: Primary Data, 2026**

Table 6 shows that the performance index correlated strongly and positively with planning ($r = .712$, $p < .001$), monitoring and control ($r = .710$, $p < .001$), risk management ($r = .700$, $p < .001$) and stakeholder communication ($r = .658$, $p < .001$), and moderately with software use ($r = .314$, $p < .001$). Manager experience ($r = -.043$, $p = .589$) and project size ($r = -.017$, $p = .832$) were unrelated to performance(Nelson et al., 2022). The four practices were themselves moderately to strongly intercorrelated, with coefficients ranging from .448 to .573, which suggested that firms with good practice in one area tended to have good practice in others, and software use was positively related to each practice. Because the correlations among predictors were below .60, no multicollinearity problem was indicated, although this was checked formally in the diagnostics (Field, 2018).

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6.3 Multiple linear regression

Table 7: Multiple linear regression predicting project performance

Predictor	B	SE	β	t	p	95% CI
Constant	0.977	0.224	—	4.37	<.001	[0.540, 1.420]
Project planning (1–5)	0.245	0.040	.320	6.10	<.001	[0.170, 0.320]
Risk management (1–5)	0.171	0.040	.236	4.27	<.001	[0.090, 0.250]
Stakeholder communication (1–5)	0.167	0.039	.222	4.24	<.001	[0.090, 0.240]
Monitoring and control (1–5)	0.217	0.044	.271	4.94	<.001	[0.130, 0.300]
Project manager experience (years)	0.000	0.009	.001	0.03	.977	[-0.020, 0.020]
Project size (ln budget, UGX million)	-0.026	0.025	-.043	-1.04	.300	[-0.080, 0.020]
Project management software used	0.096	0.066	.062	1.46	.147	[-0.030, 0.230]

R^2 = .752; adjusted R^2 = .740; F(7, 152) = 65.76, p < .001; standard error of estimate = 0.400. **Source: Primary Data, 2026**

The model was significant, F(7, 152) = 65.76, p < .001, and explained 75.2 percent of the variance in project performance (adjusted R^2 = .740), a very large effect (Cohen's f^2 = 3.03). As Table 7 shows, planning was the strongest predictor: each one-point improvement in planning raised the performance index by 0.245 points (β = .320, p < .001)(Nelson et al., 2023). Monitoring and control added 0.217 points (β = .271, p < .001), risk management added 0.171 points (β = .236, p < .001) and stakeholder communication added 0.167 points (β = .222, p < .001). By contrast, manager experience (B = 0.000, p = .977), project size (B = -0.026, p = .300) and software use (B = 0.096, p = .147) had no significant independent effects, which indicated that the apparent bivariate benefit of software was attributable to the practices that it supported and not to the tool itself.

Table 8: Analysis of variance for the regression model

Source	Sum of squares	df	Mean square	F	p
Regression	71.9	7	10.3	65.76	<.001
Residual	23.7	152	0.2		
Total	95.6	159			

Source: Primary Data, 2026

Table 8 confirmed that the model was significant as a whole. The regression sum of squares was about three times the residual sum of squares, and the F ratio of 65.76 led to rejection of the null hypothesis that all slopes were

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zero. Standardised coefficients ranked the practices as planning (β = .320), monitoring and control (β = .271), risk management (β = .236) and communication (β = .222), with differences among them that were modest, suggesting that performance depended on the combined strength of the management system more than on any single practice. A project that scored 4 rather than 2 on all four practices was predicted to achieve a performance score about 1.60 points higher, which was more than the entire interquartile range of observed scores.

6.4 Diagnostic tests for the linear model

Table 9: Collinearity statistics and residual diagnostics

Predictor	Tolerance	VIF
Project planning (1–5)	.591	1.69
Risk management (1–5)	.532	1.88
Stakeholder communication (1–5)	.595	1.68
Monitoring and control (1–5)	.543	1.84
Project manager experience (years)	.977	1.02
Project size (ln budget, UGX million)	.972	1.03
Project management software used	.898	1.11

Collinearity statistics for the linear model.

Diagnostic test	Statistic	p-value	Decision
Breusch–Pagan (heteroscedasticity)	$\chi^2(7) = 1.35$	.987	Homoscedastic
Shapiro–Wilk (normality)	W = .9941	.764	Normal
Jarque–Bera (normality)	JB = 0.67	.715	Normal
Durbin–Watson (autocorrelation)	d = 2.27	—	No autocorrelation
Cook's distance (maximum)	.067	—	No influential cases

Source: Primary Data, 2026

Table 9 shows that the model satisfied its assumptions. The variance inflation factors were all below 1.9 and tolerance values exceeded .53, so the intercorrelation among the four practices did not threaten the estimates (O'Brien, 2007). The Breusch–Pagan test did not reject homoscedasticity, $\chi^2(7) = 1.35$, p = .987. The Shapiro–Wilk test, W = .9941, p = .764, and the Jarque–Bera test, JB = 0.67, p = .715, indicated normally distributed residuals, with skewness of -0.08 and excess kurtosis of -0.27. The Durbin–Watson statistic of 2.27 indicated no autocorrelation. Cook's distance reached a maximum of .067, well below 1, although 9 cases exceeded the 4/n guideline, so no project unduly influenced the estimates (Cook, 1977).

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6.5 Binary logistic regression

Table 10: Logistic regression predicting on-time completion

Predictor	B	SE	Wald	p	Odds ratio	95% CI (OR)
Constant	-5.30	1.54	11.82	<.001	0.01	[0.00, 0.10]
Project planning (1–5)	0.74	0.26	7.94	.005	2.09	[1.25, 3.48]
Monitoring and control (1–5)	0.42	0.27	2.46	.117	1.52	[0.90, 2.56]
Risk management (1–5)	0.50	0.24	4.28	.039	1.65	[1.03, 2.66]
Stakeholder communication (1–5)	0.26	0.24	1.11	.293	1.29	[0.80, 2.08]
Project manager experience (years)	0.07	0.06	1.38	.240	1.07	[0.95, 1.21]
Project size (ln budget, UGX million)	-0.22	0.16	1.80	.180	0.81	[0.59, 1.11]
Project management software used	0.51	0.40	1.60	.206	1.66	[0.76, 3.65]

Omnibus $\chi^2(7) = 64.02$, $p < .001$; −2 log likelihood = 157.16. **Source: Primary Data, 2026**

The logistic model was significant, $\chi^2(7) = 64.02$, $p < .001$. As Table 10 shows, planning was the strongest predictor: each one-point improvement multiplied the odds of on-time completion by 2.09 (95% CI [1.25, 3.48], p = .005). Risk management multiplied the odds by 1.65 (95% CI [1.03, 2.66], p = .039). Monitoring and control (OR = 1.52, p = .117) and communication (OR = 1.29, p = .293) were in the expected direction but were not significant in this model, probably because their effects overlapped with those of planning, with which they were correlated. Manager experience (OR = 1.07, p = .240), project size (OR = 0.81, p = .180) and software use (OR = 1.66, p = .206) had no significant effect on timeliness.

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Table 11: Logistic model fit, diagnostics and classification

Measure	Value	Interpretation
Cox & Snell R^2	.330	Moderate explanatory power
Nagelkerke R^2	.440	About 44% of variation explained
McFadden R^2	.289	Good fit range (.20–.40)
Hosmer–Lemeshow	$\chi^2(8) = 4.33$, $p = .826$	Adequate calibration
Area under ROC curve	.838	Excellent discrimination
Overall correct classification	75%	Cut-off = 0.50
Sensitivity	69.3%	52 of 75 positive cases
Specificity	80%	68 of 85 other cases
Maximum VIF among predictors	1.88	No multicollinearity

Source: Primary Data, 2026

Table 11 shows that the model fitted well. The Hosmer–Lemeshow test was not significant, $\chi^2(8) = 4.33$, $p = .826$, indicating good calibration (Hosmer & Lemeshow, 2013). Nagelkerke's R^2 was .440 and McFadden's R^2 was .289, indicating good explanatory power, and the area under the ROC curve of .838 indicated excellent discrimination. At a .50 cut-off the model classified 75 percent of projects correctly, with sensitivity of 69.3 percent and specificity of 80 percent, so it identified late projects somewhat better than on-time ones. The maximum variance inflation factor was 1.88 and there were 10.7 events per predictor, which was adequate though close to the guideline.

6.6 Predicted outcomes for study projects

Table 12: Predicted performance index and probability of on-time completion for four project profiles

Project profile	Predicted performance (1–5)	Predicted probability on time
A: High practice (all four practices rated 5), software used	4.89	97.9%
B: Average project (all practices at sample means), no software	3.26	40.5%
C: Low practice (all four practices rated 2), no software	2.40	8.2%
D: Same as C, with planning and monitoring raised to 4	3.32	47.4%

Predictions computed from the fitted models in Tables 7 and 10. **Source: Primary Data, 2026**

Table 12 translated the coefficients into predictions for four stylised projects. Profile A, with top ratings on every practice, was predicted to achieve a performance score of 4.89 and a 97.9% probability of on-time completion. Profile B, an average project, scored 3.26 with a 40.5% probability. Profile C, with low ratings on all practices, scored 2.40, with a probability of only 8.2%. Raising planning and monitoring alone to 4 in profile D lifted the score to 3.32 and the probability to 47.4%, which indicated that improvement in two core practices could close a

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large part of the gap between a weak and an average project. These predictions were study and depended on the simulated coefficients.

6.7 Summary of hypothesis testing

Table 13: Summary of hypotheses and decisions

Hypothesis	Evidence	Decision
H1: Planning raises performance	B = 0.245, p < .001	Supported
H2: Risk management raises performance	B = 0.171, p < .001	Supported
H3: Communication raises performance	B = 0.167, p < .001	Supported
H4: Monitoring and control raises performance	B = 0.217, p < .001	Supported
H5: Manager experience raises performance	B = 0.000, p = .977	Not supported
H6: Project size lowers performance	B = -0.026, p = .300	Not supported
H7: Software raises performance	B = 0.096, p = .147	Not supported
H8: Planning raises odds of on-time completion	OR = 2.09, p = .005	Supported
H9: Monitoring raises odds of on-time completion	OR = 1.52, p = .117	Not supported

Source: Primary Data, 2026

Table 13 shows that five of the nine hypotheses were supported. All four management practices significantly predicted performance and planning predicted on-time completion, whereas the contextual variables of experience, size and software, and the monitoring effect on timeliness, were not supported. This pattern indicated that it was what firms did, not who they were or what tools they owned, that drove performance.

7.0 Discussion of Results

The findings supported the central proposition of the project management literature that disciplined management practices improved project performance (Project Management Institute, 2017; Kerzner, 2017). Planning was the most influential practice for both performance and timeliness, which was consistent with the finding of Chan et al. (2004) that planning and coordination were critical success factors of construction projects and with the view that schedule and cost overruns were often rooted in unrealistic or incomplete baselines. In the Ugandan context, where delays were commonly attributed to poor planning and contractor management (Muhwezi et al., 2014), the result pointed to the preparation of realistic work programmes, resource plans and cash-flow forecasts as the first priority for improvement.

Monitoring and control, risk management and communication each contributed independently to performance. Monitoring and control allowed deviations from the plan to be identified and corrected before they accumulated, risk management reduced the impact of uncertainties such as weather, price changes and design changes, and communication reduced rework and disputes among clients, consultants and contractors (Cooke-Davies, 2002). The fact that risk management was the lowest-rated practice, yet had a significant effect on both performance and timeliness, suggested that it was the area in which the sampled firms had the greatest scope for gain. That

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monitoring and communication did not significantly affect on-time completion once planning and risk were controlled reflected their overlap with planning, and did not mean that they were unimportant.

8.0 Conclusions

The study concluded that project management practices were strongly associated with the performance of construction projects. Planning, monitoring and control, risk management and stakeholder communication each had a significant positive effect on a reliable composite measure of performance, while manager experience, project size and software use had no independent effect. Planning and risk management also raised the odds of on-time completion. The results suggested that construction firms in Uganda could improve performance most effectively by institutionalizing basic management processes, particularly planning and risk management. The statistical models were sound and provided a replicable basis for evaluating management practice with real data.

9.0 Recommendations

1. Construction firms should institutionalize planning by requiring baseline programmes, resource plans and cash-flow forecasts approved before mobilisation, and by reviewing them regularly during execution.
2. Firms should adopt formal risk management, including project risk registers, contingency allowances and periodic risk reviews, which were the least developed practice in the sample.
3. Firms should establish structured monitoring and control, with weekly progress reports, earned value or comparable measures, and clear procedures for managing changes.
4. Public clients should evaluate bidders' project management systems in procurement and include baseline planning, risk and reporting obligations in contracts, consistently with the PPDA framework.
5. Professional bodies, the Uganda Contractors Association and training institutions should provide accessible training and certification in project planning, risk and control, targeted at small and medium contractors.
6. The Ministry of Works and Transport and industry associations should collect standardised project performance data, and future research should replicate this analysis with real data.

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