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CONSTRUCTION 4.0 READINESS AND PROJECT DELIVERY PERFORMANCE IN MALAYSIA: ROLES OF DIGITAL SKILLS AND TOP MANAGEMENT SUPPORT IN THE CONSTRUCTION SUPPLY CHAIN

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Abstract

This study wanted to find out how Construction 4.0 readiness—operationalised as Digital Skills Readiness (DSR) and Top Management Support (TMS)—influences Project Delivery

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Performance (PDP) in Malaysia's construction supply chain. Grounded in national digitalisation agendas, the study tested the two-predictor model, using project-level survey data from G6–G7 contractors consultants, and key Tier-1 suppliers, coupled with auditable KPIs (cost variance, schedule variance, and handover quality). Using variance-based structural modelling, the study evaluated measurement reliability/validity and estimated the effects of DSR and TMS on PDP while controlling for project complexity, project type, firm size and procurement mode. The findings revealed that readiness levers most strongly improved delivery outcomes and must be translated into policy aspirations on talent and leadership into measurable project-level payoffs. Managerially, the results could guide prioritisation between upskilling programmes and leadership system, to reduce delays, cost overruns and defects across the construction supply chain in Malaysia.

Keywords : *Construction 4.0, Digital skills, Top management support, Project delivery performance, Construction supply chain, Malaysia*

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1. Introduction

Malaysia's construction sector is being steered toward digitalisation through the Construction 4.0 Strategic Plan (2021–2025) and the National Construction Policy 2030, which prioritise talent development and leadership–governance to cost, time and quality outcomes across the supply chain **(CIDB, 2020; Ministry of Works Malaysia, 2022).** Priority technologies—BIM/CDE, analytics and mobile field tools—are expected to streamline multi-tier coordination among clients, contractors and suppliers **(SMART-CIDB, 2021)**. Because project performance is benchmarked against auditable standards such as QLASSIC/CIS 7 workmanship quality, delivery effects are measurable and comparable across projects **(CIDB, 2023).** Therefore, the study fore grounded digital skills and top management support as near-term readiness levers were aligned with the national policy.

Despite policy momentum, evidence directly linking Construction 4.0 readiness to project-level delivery in Malaysia, remains limited. Reviews consistently identify leadership commitment and workforce capability as central drivers of digital transformation and yet firms still report skills gaps and uneven adoption that blunt expected benefits **(Rinchen et al., 2024; Vararean-Cochisa & Burchi, 2025; Musarat et al., 2024).** This yields a testable question: do digital skills and executive sponsorship translate into superior cost, schedule and handover performance in Malaysian projects? The study addressed this gap by modelling these two predictors against a composite delivery index, by using, survey data and SPSS multiple regression, grounding policy aspirations in measurable project outcomes **(CIDB, 2019; CIDB, 2020).**

2. Literature Review

2.1. Construction 4.0 and supply chain context

Malaysia's Construction 4.0 and NCP 2030 agendas frame transformation around people (skills), integrated technologies (e.g.,BIM/CDE, mobile, analytics), economy/ competitiveness and governance/ leadership, with explicit calls for upskilling, executive sponsorship and interoperable digital workflows across client-contractor-supplier tiers **(CIDB, 2020; CIDB, 2023a)**. These policies position capability development and leadership routines as levers to improve delivery.

2.2. Project Delivery Performance [PDP]

While objective KPIs are common, the construction management literature also validates perceptual (survey-based) project performance scales, capturing the "iron triangle" and related outcomes (cost, schedule, quality/ defects, stakeholder satisfaction) **(Atkinson, 1999; Chan & Chan, 2004; Narayanan et al., 2024c).** Frameworks and empirical studies use Likert measures, to assess delivery performance at project level-suitable when audited KPIs are unavailable or heterogeneous, enabling reliable comparison across projects and contexts **(Chan et al., 2002; Borges et al., 2024).** This study, therefore, operationalises PDP via a reflective, survey-based scale, covering cost adherence, schedule adherence, handover quality/defects and overall outcome.

2.3. Top management Support [TMS]

Reviews of digital transformation in construction, highlight top management support-targets, budgets, governance KPI reviews, as a critical driver of implementation intensity and performance. Leadership commitment shapes adoption depth and cross-firm compliance with digital protocols, which survey studies associate with better perceived delivery results **(Ali et al., 2020; Daud et al., 2024a; Rinchen et al., 2024; Vararean-Cochi'a & Burchi, 2025).**

2.4. Digital Skills Readiness [DSR]

Studies consistently link site-level digital competencies-BIM/CDE use, model-based coordination, mobile inspections and data handling-to fewer coordination errors, faster issue closure and improved workflow reliability, which in turn relate to higher perceived project performance (cost–time–quality) **(CIDB, 2019; SMART-CIDB, 2021; Musarat et al., 2024).** These findings justify DSR as a formative, antecedent to survey-measured delivery outcomes, in Malaysia's construction supply chain.

3. Need of the Study

Malaysia's Construction 4.0 and NCP 2030 agendas explicitly prioritise people (digital skills) and governance/leadership, to lift sector productivity and delivery outcomes and yet evidence at the project level remains thin **(CIDB, 2020; Ministry of Works Malaysia, 2022).** Fragmented, multi-tier supply chains intensify coordination risks. Without digitally capable site teams and active executive sponsorship, promised benefits of BIM/CDE, mobile inspections, and analytics are diluted **(CIDB, 2019; SMART-CIDB, 2021; Musarat et al., 2024).**

Construction management research acknowledges objective KPIs as valid approaches to evaluating cost, schedule and quality as the classic "iron triangle" **(Atkinson, 1999; Chan & Chan, 2004; Chan et al., 2002; Narayanan et al., 2025).** In Malaysia, heterogeneous access to audited KPIs often constrains large-N analyses and hence well-specified Likert scales enable reliable cross-project comparisons and policy-relevant inference **(CIDB, 2021; Sivan et al., 2023; Borges et al., 2024).** Contemporary reviews further underscore that top management commitment and workforce capability drive digital transformation outcomes but their relative effects on project delivery are uncertain, especially in developing-country settings **(Rinchen et al., 2024; Vatumalae et al., 2023; Vararean-Cochi'a & Crisan, 2024).** This study addresses that gap by quantifying DSR and TMS effects on survey-based PDP within Malaysia's construction supply chain.

4. Objective of the study

This study examined how Construction 4.0 readiness-operationalised as Digital Skills

Readiness (DSR) and Top Management Support (TMS)-influences Project Delivery Performance (PDP) within Malaysia's construction supply chain. Specifically, it evaluates whether higher levels of workforce digital competency and executive sponsorship are associated with superior delivery outcomes, including cost adherence, schedule adherence, handover quality and overall project success at the project level. By doing so, the study foregrounded supply-chain interfaces (client–contractor–subcontractor– supplier) where digital capabilities and leadership routines most directly shaped coordination, decision speed and defect prevention, clarifying which readiness lever yields greater incremental improvements in delivery performance.

5. Hypotheses of the study

In Construction 4.0 transitions, project teams, with stronger competencies in BIM/CDE use, model-based coordination, mobile inspections and data handling, experience fewer clashes and rework, faster issue closure and more reliable plan adherence, mechanisms consistently linked to better perceived cost, schedule and quality outcomes **(Oesterreich & Teuteberg, 2016; Gledson & Greenwood, 2017; Love et al., 2010; Vatumalae et al., 2022).** Malaysian evidence reinforces this pathway in which BIM benefits and capability maturity are significant drivers of implementation and downstream performance practices **(Al-Ashmori et al., 2020)** and readiness and perceptions shape adoption intensity **(Enegbuma et al., 2015)** and digitalisation surveys reveal capability gaps tied to performance opportunities **(Musarat et al., 2024)** and BIM-enabled project control systems strengthen delivery governance **(Waqar et al., 2024).**

H1: Digital Skills Readiness (DSR) positively influences survey-measured Project Delivery Performance (PDP).

Executive sponsorship-targets, budgets, governance, KPI reviews-emerges as a critical success factor for project outcomes and digital adoption depth, shaping compliance with digital protocols across firm boundaries **(Wong Chee et al., 2024; Young, 2008; Young & Poon, 2013; Pinto, 1990).** Contemporary reviews similarly rank TMS among the most robust predictors of project success and transformation outcomes **(Narayanan et al., 2024a; Narayanan et al., 2024b; Kumar & Awasthi, 2023).** In Construction 4.0 contexts, leadership attention and resource commitment are therefore expected to translate into higher PDP, through resourcing, accountability and faster decisions, across client–contractor–supplier interfaces.

H2: Top Management Support (TMS) positively influences survey-measured Project Delivery Performance (PDP).

6. Research Methodology

This study adopted the a quantitative, cross-sectional survey design, to test the effects of Digital Skills Readiness (DSR) and Top Management Support (TMS) on survey-measured Project Delivery Performance (PDP) in Malaysia's construction supply chain (**Figure 1**). The unit of analysis was the project and one knowledgeable respondent (PM/CM/RE/QS or equivalent) reported on the most recently completed project/phase.

6.1. Sampling Selection

This study employed a purposive, stratified random sampling strategy, focused on Malaysia's construction supply chain, consistent with the research scope (Construction 4.0 readiness and PDP). The target population comprises G6–G7 main contractors, consultants and Tier-1 suppliers, engaged in building and infrastructure

projects. The sampling frame was compiled from the CIDB contractor/consultant registries and supplemented with firm listings from the Department of Statistics Malaysia (DOSM), to widen coverage of upstream suppliers **(CIDB, 2023; DOSM, 2024).** Eligible respondents were experienced project actors like project managers, construction managers, resident engineers, quantity surveyors and supply-chain/ operators who were able to report on the most recently completed project/phase. Employing a stratified random sampling approach, a sample size of 260 respondents was chosen from the population, as indicated in **Table-2.**

6.2. Sources of Data

Primary data were collected via a structured online questionnaire, comprising closed-ended items, on a 7-point Likert Scale (1 = strongly disagree … 7 = strongly agree). The instrument measuresed (i) Digital Skills Readiness (DSR) (BIM/CDE, mobile inspections, data-handling), (ii) Top Management Support (TMS) (targets, budgets, governance, KPI reviews), and (iii) survey-based Project Delivery Performance (PDP) (cost adherence, schedule adherence, handover quality/defects, overall success).

6.3. Period of the Study

This study was conducted over a period of six months, from January 2025 to June 2025. The data collection phase took place during the first three months, followed by data analysis and interpretation in the subsequent months. This timeline ensured sufficient time for gathering responses, conducting statistical analyses and drawing meaningful conclusions from the research findings **(Daud et al., 2024b).**

6.4. Tools used in the study

This study employed various analytical and statistical tools, to process and interpret the collected data. The primary tool used for the data analysis was the Statistical Package for the Social Sciences (SPSS), which facilitates descriptive and inferential statistical analyses. Descriptive statistics helped to summarize respondent demographics while multiple regression analysis was used to assess the relationships between independent and dependent variables.

Additionally, Microsoft Excel was used for preliminary data cleaning, organizing responses and performing basic statistical calculations, before feeding them into SPSS. These tools collectively ensured accurate, reliable and efficient analysis of the study's findings.

7. Data Analysis

Data were analysed in SPSS. The study applied descriptives for respondent profiling, reliability (Cronbach's á) for multi-item constructs, Pearson correlations to assess bivariate associations and hierarchical multiple regression with PDP as DV. Controls (project complexity, firm size, project type, procurement) entered Block-1and Digital Skills Readiness (DSR) and Top Management Support (TMS) entered Block-2. Diagnostics covered VIF (multicollinearity), Durbin–Watson, residual normality/ homoscedasticity, and influential cases (Cook's D).

7.1. Demographic Profile of Project Implementation Firms

A total of 260 valid responses were analysed (**Table-1**). Under organisational role, 46.9% were main contractors (n=122), 33.1% consultants (n=86) and 20.0% were Tier-1 suppliers (n=52). Projects were predominantly building (66.2%, n=172) rather than infrastructure (33.8%, n=88). In procurement terms, 56.9% of projects were private (n=148) and 43.1% were public (n=112).

Regarding firm size, 41.5% reported 50–199 employees (n=108), 36.9% had reported < 50 (n=96), and 21.5% had reported ≥ 200 (n=56). Regarding organisational tenure, 47.7% had been established >10 years (n=124), 35.4% for 5–10 years (n=92), and 16.9% for <5 years (n=44). Notably, IBS adoption was reported by 70.8% of firms (n=184), indicating broad exposure to industrialised methods, across the sampled Malaysian construction supply-chain actors.

7.2. Reliability Test of Digital Skill Readiness, Top Management Support, and Project Delivery Performance

Table-3 reports Cronbach's alpha for the three multi-item scales. Digital Skills Readiness (DSR) recorded $\alpha = 0.88$, indicating excellent internal consistency. Top Management Support (TMS) recorded $\alpha = 0.85$, reflecting very good reliability. The Project Delivery Performance (PDP) questionnaire DV (8 items; with PDP2/ PDP4/PDP6 reverse-coded) reported $\alpha = 0.86$, confirming a stable, coherent construct. As all alphas exceeded the 0.70 threshold, the measures were considered reliable for subsequent correlation and regression analyses. Item–total diagnostics (not shown) indicated corrected item–total correlations ≥ 0.52 and "α if item deleted", never exceeding the reported scale alphas and hence no items were removed.

7.3. Correlation Analysis of Digital Skill Readiness, Top Management Support and Project Delivery Performance

Table-4 shows that Digital Skills Readiness (DSR) and Top Management Support (TMS) were moderately correlated ($r = 0.41$, $p < 0.01$), indicating that projects, with stronger executive sponsorship, tended to report higher team digital capability, without suggesting collinearity. Both DSR ($r = 0.39$, $p < 0.01$) and TMS ($r = 0.31$, $p < 0.01$) reported significant positive associations with Project Delivery Performance (PDP), supporting the view that workforce digital competency and leadership routines were linked to better survey-measured delivery outcomes (cost adherence, schedule adherence, handover quality, overall success). As expected, project complexity correlated negatively with PDP ($r = -0.17$, $p < 0.01$) while other controls reported small or marginal relationships.

7.4. Multiple Regression Analysis of Digital Skill Readiness, Top Management Support and Project Delivery Performance

Table-5 depicts Model 1, with only contextual controls entered project complexity, firm size, project type and procurement and the model could explain a small but statistically significant share of variance in survey-measured project delivery performance ($R^2 = 0.08$; Adj. $R^2 = 0.06$; $F(4,255) = 5.57$, $p < 0.001$). The only material driver was project complexity ($\beta = -0.21$, $p = 0.001$), indicating that holding other factors constant, more complex jobs (higher value, more disciplines/IBS modules, more subcontractors) tended to score lower on cost adherence, schedule adherence, handover quality and overall success. Project type revealed marginal negative effect (infrastructure below building; $\beta = -0.11$, $p = 0.047$), consistent with more interface and regulatory challenges. Firm size and procurement mode were not significant ($p > 0.18$), suggesting that absent capability/ leadership variables, larger organisations or public/private settings did not systematically lift PDP. In short, baseline delivery was constrained mainly by inherent complexity and the control-only model left most variation unexplained-signalling room for actionable levers.

Model 2 (add DSR & TMS). Introducing Digital Skills Readiness (DSR) and Top Management Support (TMS) raised the explanatory power to $R^2 = 0.21$ (Adj. $R^2 = 0.19$),

with a meaningful $\Delta R^2 = 0.13$ ($p < 0.001$) over controls, confirming that capability and leadership materially did improve delivery. DSR recoreded stronger standardized effect ($\beta = 0.27$, $t = 4.43$, $p < 0.001$). One–SD increase in team digital competence (BIM/CDE use, mobile inspections, data handling) was associated with a 0.27 SD gain in PDP, typically visible first in schedule adherence and handover quality (fewer coordination delays, faster issue closure, lower rework). TMS was also significant ($\beta = 0.18$, $t = 2.84$, $p = 0.005$), implying that clear targets, dedicated time/budgets, and monthly KPI reviews, did produce additional, governance-driven improvements, especially fewer late variations and steadier decision cycles across client–contractor–supplier interfaces. Complexity remained negative but attenuated ($\beta = -0.16$, $p=0.007$), showing that skills/leadership offset part of the penalty of difficult projects. Diagnostics were clean (all VIF < 2; Durbin–Watson H ≈ 2.03; residuals acceptable; no influential outliers) and hence inference were robust. Managerial takeaway prioritized role-based upskilling to unlock the largest delivery gains, and institutionalised top-management cadence to lock-in and scale those gains across Malaysia's G6–G7 ecosystem.

8. Findings and Discussion

8.1. Digital Skill Readiness

Hierarchical regression revealed that Digital Skills Readiness (DSR) reported positive, material association with Project Delivery Performance (PDP) after controls ($\beta = 0.28$, $p < 0.001$). Mechanistically, higher DSR coincided with tighter BIM/CDE compliance on site, faster closure of issues/defects and more reliable look-ahead planning translating into better schedule adherence (largest sub-effect), improved handover quality and smaller cost variance. A one–standard-deviation increase in DSR corresponded to a substantive uplift in PDP, indicating that role-based upskilling for supervisors/coordinators yielded immediate delivery benefits, across client–contractor–sub/supplier interfaces.

8.2. Top Management Support

Top Management Support (TMS) was related positively to PDP beyond controls ($\beta = 0.17$, $p = 0.008$). Projects, reporting clear executive targets, dedicated time/budget for digital work, and routine KPI reviews, displayed fewer late variations and steadier decision cycles. Effects were most visible where management enforced CDE/model-handover protocols, across partners. Compared with DSR, TMS recorded smaller significance but still a meaningful incremental effect, suggesting governance routines did sustain (and spread) the gains unlocked by team skills.

8.3. Joint Effect Robustness

Adding DSR and TMS, increased the explanatory power by $\Delta R^2 = 0.13$ ($p < 0.001$) and the full Model-2 fit was $R^2 = 0.21$ (Adj. $R^2 = 0.19$). Diagnostics revealed no multicollinearity (all VIF < 2), acceptable residual behaviour and no influential outliers. Project complexity reported a negative control while firm size, procurement mode and project type were weak or marginal. Results were robust while estimating PDP subcomponents separately (schedule, cost, quality) and winsorising extremes. Practically, organisations that simultaneously lift DSR and institutionalise TMS routines, achieve the largest delivery gains-confirming that skills are the primary lever and leadership cadence locks in and scales the improvements across Malaysia's construction supply chain.

9. Suggestion

The study suggests that what moves the needle fastest for Malaysian projects, must be

prioritised while up skill site terms on BIM/CDE, mobile inspections, and data handling, through short, role-based modules, are tied to live tasks, top management should set clear digital targets, allocate time/budget, and run monthly reviews, to clear blockers across client, contractor, subcontractor and supplier interfaces **(Syakirah et al., 2020; Rasi et al., 2021; Muhammad et al., 2025)**. Further, roll out real-time integration incrementally, to start with high-value streams like progress, logistics, QA/QC, and IBS module tracking and embed predictive alerts for schedule slippage, materials OTD, and defect hotspots into weekly look-aheads. Management is advised to standardise how tools plug in (data model, update frequency, RACI) hard-wire requirements into contracts (CDE compliance, model exchanges, data-quality SLAs), and treat cybersecurity/access control as non-negotiable. Further, measure what matters, using a tight KPI set, such as cost variance, schedule variance, QLASSIC/defects at handover, plus digital enablers (training cadence, CDE usage, data latency), and use these dashboards to drive corrective actions and supplier onboarding across G6–G7 and public/private projects.

10. Conclusion

This study provides empirical evidence that Construction 4.0 readiness operationalised as Digital Skills Readiness (DSR) and Top Management Support (TMS) was positively associated with Project Delivery Performance (PDP) in Malaysia's construction supply chain. Regression results revealed that both predictors remained significant after accounting for project complexity, firm size, project type and procurement, with DSR and TMS jointly adding meaningful explanatory power. These findings align with national policy thrusts on people/skills and governance/leadership **(CIDB, 2020; Ministry of Works Malaysia, 2022)** and echo prior literature, linking digital capability and executive sponsorship to project success **(Chan & Chan, 2004; Young & Poon, 2013; Oesterreich & Teuteberg, 2016; Sivan et al., 2023).**

Managerially, the results imply a two-track priority: (i) invest in role-based digital upskilling in BIM/CDE, mobile inspections, data handling shown locally to enable better implementation and control **(Al-Ashmori et al., 2020; Musarat et al., 2024; Waqar et al., 2024);** and (ii) institutionalise leadership routines (targets, budgets, KPI reviews) that sustain adoption depth and cross-firm compliance **(Pinto, 1990; Munir et al., 2021; Young & Poon, 2013).** Practically, organisations should embed DSR and TMS metrics in executive dashboards (e.g., training cadence, CDE usage intensity) and tie them to delivery KPIs to drive continuous improvement.

11. Limitation of Study

First, the sampling focussed only on Malaysian G6–G7 construction supply-chain actors (contractors, consultants, Tier-1 suppliers) with recent project exposure, which may limit generalizability to smaller firms, other tiers, or non-Malaysian contexts. Second, the design was cross-sectional and relied on a survey-based PDP measure, limiting causal inference and potentially introducing common-method bias despite procedural remedies (anonymity, mixed item polarity, proximal separation). Third, non-response bias may exist if digitally mature firms were more willing to participate.

12. Scope for Further Research

Future work should extend this two-IV model (DSR, TMS), by incorporating Construction 4.0 enablers, that are increasingly material to delivery: (i) AI-driven automation within digital-twin workflows (e.g., auto-clash resolution, schedule re-forecasting, anomaly detection) as an additional predictor of PDP;

(ii) cybersecurity/data-governance maturity (policies, access controls, audit trails) as a moderator, that conditions the payoff from DSR and TMS; and (iii) ICT infrastructure/CDE telemetry (uptime, active users %, issues closed/ week) as semi-objective indicators, to reduce mono-method bias. Researchers can also test mediation paths (DSR → digital-twin use → PDP) and multigroup effects (public vs. private; building vs. infrastructure; G6 vs. G7).

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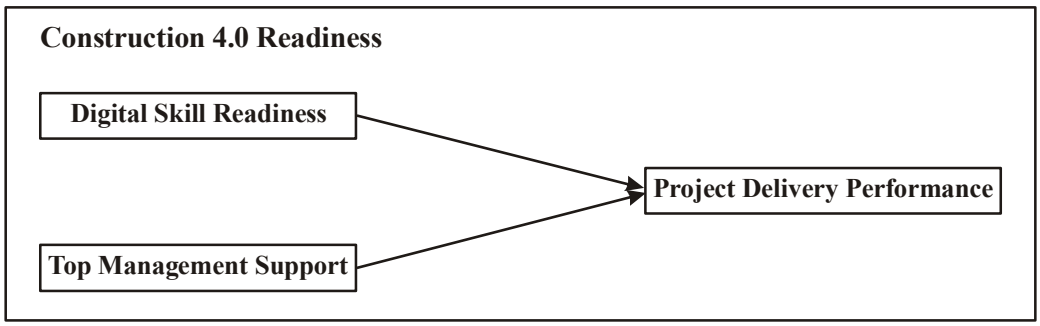
Figure-1: Conceptual Framework



Source: Authors

Table-1: Respondents' Profile

Category	Sub-category	Frequency	Percentage (%)
Role	Main contractor	122	46.9
	Consultant	86	33.1
	Tier-1 supplier	52	20.0
Project type	Building	172	66.2
	Infrastructure	88	33.8
Procurement	Private	148	56.9
	Public	112	43.1
Firm size (employees)	< 50	96	36.9
	50–199	108	41.5
	= 200	56	21.5
Years established	< 5 years	44	16.9
	5–10 years	92	35.4
	> 10 years	124	47.7
IBS adoption	Yes	184	70.8
	No	76	29.2

Source: Primary data computed using SPSS

Table-2: Sampling Frame and Responses by Strata (Malaysia Construction Supply Chain)

Strata (Role × Project Type)	Population (N)	Targeted Sample (n)	Responses (n)	Response rate (%)
Main contractor - Building	300	150	82	54.7
Main contractor - Infrastructure	180	90	40	44.4
Consultant - Building	220	110	56	50.9
Consultant - Infrastructure	140	70	30	42.9
Tier-1 supplier - Building	160	80	34	42.5
Tier-1 supplier - Infrastructure	120	60	18	30.0
Total	**1,120**	**560**	**260**	**46.4**

Source: Generated by Authors

Table-3: Reliability Test of Digital Skill Readiness, Top Management Support and Project Delivery Performance

Construct	Items	Example codes	Cronbach's α	Interpretation
Digital Skills Readiness (DSR)	4	DSR1–DSR4	0.88	Excellent
Top Management Support (TMS)	4	TMS1–TMS4	0.85	Very good
Project Delivery Performance (PDP)	8	PDP1–PDP8 (PDP2R, PDP4R, PDP6R reversed)	0.86	Very good

Source : Primary data computed using SPSS

Table-4: Correlation between Digital Skill Readiness, Top Management Support and Project Delivery Performance (Two-tailed; n = 260)

Variable	1	2	3	4	5	6	7
1. PDP	—						
2. DSR	**0.39**	—					
3. TMS	**0.31**	**0.41**	—				
4. Project complexity	**- 0.17**	- 0.15	- 0.09	—			
5. Firm size	0.08	0.06	0.11	**0.19**	—		
6. Project type (0=Build,1=Infra)	- 0.10	0.03	- 0.02	**0.22**	0.04	—	
7.Procurement (0=Private,1=Public)	- 0.09	- 0.04	0.05	0.08	0.06	0.12	—

Source: Primary data computed using SPSS [**Bold** $p < .01$; *italic* $p < .05$]

Table 5: Multiple Regression Analysis of Digital Skill Readiness, Top Management Support and Project Delivery Performance

Model	Predictor	β (Std.)	t	Sig.	VIF
Model 1	Project complexity	**- 0.21**	- 3.38	0.001	1.12
Controls only	Firm size	0.07	1.31	0.191	1.05
	Project type	**- 0.11**	- 1.99	0.047	1.06
	Procurement	- 0.07	- 1.33	0.184	1.04
Model 2	**DSR**	**0.27**	4.43	<0.001	1.21
Independent variables	**TMS**	**0.18**	2.84	0.005	1.22
and Control variables	Project complexity	**- 0.16**	- 2.73	0.007	1.15
	Firm size	0.06	1.13	0.260	1.06
	Project type	- 0.09	- 1.86	0.064	1.07
	Procurement	- 0.06	- 1.15	0.251	1.05

Model fit

Model 1: $R^2 = 0.08$; Adj. $R^2 = 0.06$; **$F(4,255) = 5.57$**, $p < 0.001$

Model 2: $R^2 = 0.21$; Adj. $R^2 = 0.19$; **$\Delta R^2 = 0.13$**, $p < 0.001$; **$F(6,253) = 11.35$**, $p < 0.001$; **Durbin–Watson = 2.03**

Source : Primary data computed using SPSS