

Competencies of Project Owners' Managers in Indonesia's Public Construction Sector Based on SKKNI 390-2015 and PMBOK 6th Edition to Improve Project Time Performance

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ABSTRACT The success of government projects that align with optimal project performance represents a major challenge for Project Manager Owners, particularly heads of divisions within Regional Government Organizations involved in the construction sector. In practice, several regional projects are often not completed by the end of the fiscal year, which results in decreased public satisfaction. The competency of Project Manager Owners plays a significant role in ensuring project success, particularly in achieving timely project completion.

This study aims to identify the core knowledge and skill competencies required by owner-side project managers for the effective administration of public construction projects in an Indonesian municipality, This study examines which competencies were most highly applied by owner project managers and investigates how knowledge and skill based competencies affect project time performance. The research was conducted using competency analysis based on the Indonesian National Work Competency Standards (SKKNI 390-2015) for Intermediate Construction Experts and the PMBOK Guide 6th Edition (2017).

Empirical data were acquired through questionnaires administered to 65 included government project managers acting as public-sector owner, which were then analyzed using descriptive statistics. The findings highlight project integration management, respond to adapt and change, Helping Relationship/ culture and values, quality management, as well as scheduling and planning management as the most critical competencies. The highest levels of competency implementation are scheduling and planning management, and project integration. Management. Furthermore, skill-based competencies exert a stronger effect than knowledge-based competencies on the improvement of project time performance. Ultimately, this research offers significant insights into the fundamental qualifications expected of government project managers, providing a strategic framework for the Central Government and educational institutions to develop specialized training programs.

KEYWORDS: Competence, Project Manager Owner, SKKNI 390-2015, PMBOK 6th, Project time performance

I. INTRODUCTION

Project managers play a crucial role in all types of projects and significantly influence project

success [1, 2] Their role is particularly distinctive in public sector projects, as such projects invariably involve multiple stakeholders whose views can

substantially affect project implementation. Project managers are therefore central to leading project teams in achieving project objectives. In public organizations, effective project management is essential for driving progress, enhancing efficiency, and accomplishing strategic goals. It is widely recognized that one of the most prominent challenges faced by both developed and developing countries is the failure of public projects, which results in delays in project development as well as in the achievement of governmental agendas and objectives [3]. Project delays may lead to project failure [4] cause governments to incur substantial financial losses [5] and contribute to stagnation in national development growth [6]. A lack of knowledge, experience, and competence is one of the causes of project delays [7], Such delays therefore need to be anticipated. [8]. Argue that the overall competencies possessed by a project manager can determine project success, as project manager competence is highly critical to successful project delivery. Similarly, project success depends greatly on the expertise of the project manager [9]. Therefore, meeting competency demands requires the presence of reliable and experienced project managers. These competencies can be measured through mastery of knowledge and skills [9]. Research findings also indicate that human resources significantly affect delays in budget absorption. The incompetence of budget-managing officials or employees causes the duties and obligations of organizations or companies to be carried out suboptimally, which ultimately hampers budget absorption [10].

Despite the substantial body of research on project manager competency development, limited attention has been given to the specific competencies required of owner-side project managers in Indonesia's public construction sector. In particular, no study has comprehensively examined these competencies with reference to the Indonesian National Work Competency Standards SKKNI 390-2015 [11] for Intermediate Construction Experts and the PMBOK Guide, 6th Edition-2017[12], especially in terms of the knowledge and skills essential for this role. This study seeks to address this gap by identifying the specific competencies needed by owner-side project managers to enhance construction project outcomes,

particularly with respect to timely completion. The findings provide a set of key competencies that can support project managers in delivering projects on schedule.

II. METHOD

Research Design

The literature review provides an in-depth understanding of recent advances in project management competencies, highlighting opportunities to identify an appropriate methodological framework and the competency areas relevant to this study. Consistent with the research objectives and prior studies, the methodology adopted in this research aligns with previous studies on project manager competencies in the construction industry [13,14]. This study employed a literature review and a questionnaire survey. First, a literature review was conducted prior to data collection and served as the basis for the development of the survey instrument. The identification of competencies was based on SKKNI 390-2015 for Intermediate Construction Management Experts, which is nationally applied, and was integrated with the PMBOK 6th Edition (2017) as an international standard, as well as relevant previous studies on project manager competencies in the construction industry. As a result, 34 competencies were identified, as presented in Table 1. The survey was then administered to (1) rank the importance of these competencies and (2) assess the extent to which these competencies influence the improvement of time performance in public construction projects in one city in Indonesia.

List of competencies

Project manager competencies were identified through a review of relevant studies. The identified competencies, together with their corresponding references, are presented in Table 1. Based on the literature, SKKNI 390-2015 for Intermediate Construction Management Experts, and the PMBOK 6th Edition (2017), the competencies required of owner-side project managers comprise 34 aspects, consisting of 17 knowledge competencies and 17 skill competencies, as shown in Table 1.

Questionnaire design

The questionnaire survey was designed to align with the aims and objectives of the study, while incorporating a comprehensive literature-based analysis of the core knowledge and skills considered essential for competent project managers. The questionnaire consisted of four sections. The first section was developed to obtain the respondents' background information, including their academic qualifications. The second section presented a list of competencies required for client-side project managers. The third section assessed the extent to which these competencies were implemented in practice.

Respondents were asked to rate the level of importance of the competencies required of owner-side project managers in public construction projects at their workplace using a five-point Likert scale, where 1 = "Very unimportant," 2 = "Unimportant," 3 = "Moderately important," 4 = "Important," and 5 = "Very important." In the final section, respondents assessed the implementation of owner-side project manager competencies using a five-point Likert scale, where 1 = "Never," 2 = "Rarely," 3 = "Moderately," 4 = "Often," and 5 = "Always." The fourth section of the questionnaire evaluates the time performance of the project lead.

Table 1. Research Variables Competencies

	Kode	Competencies
X1 Knowledge Competencies [15]	X1.1	Integration management [12]
	X1.2	Scope management [11,12,15]
	X1.3	Schedule management and planning [11,12,15]
	X1.4	Cost management [11,12,15]
	X1.5	Human resource management [11,12,15]
	X1.6	Risk management [11,12,15]
	X1.7	Quality management [11,12,15]
	X1.8	Stakeholder management [11,12,15]
	X1.9	Communication management [11,12,15]
	X1.10	Conflict, claim, and dispute management [11,12,15]

	Kode	Competencies
	X1.11	Safety, health, and environment management [11,12,15]
	X1.12	Procurement management [11,12,15]
	X1.13	Equipment and material resource management [11,15]
	X1.14	Information technology management [11,15]
	X1.15	Ethical management [11,15]
	X1.16	Technical management [11,15]
	X1.17	Knowing AI [16]
X2. Skill Competencies [15]	X2.1	Delegation [15]
	X2.2	Leadership [11,15]
	X2.3	Decision making [11,15]
	X2.4	Problem Solving [15]
	X2.5	Teamwork [11,15]
	X2.6	Analitic [17]
	X2.7	Integrity [17]
	X2.8	Negotiation [11,15]
	X2.9	Administrative Skill [18]
	X2.10	Politically Sensitive [19]
	X2.11	Results orientation [20]
	X2.12	Public Service [17]
	X2.13	Developing others [21]
	X2.14	Respond to change and adapt [3]
	X2.15	Helping relationship/ Culture and values [22]
	X2.16	Cultural Awareness [19]
	X2.17	Implementating AI [16]

Source: Processed Data, 2026

Each competencies was broken into sub-competency items based on SKKNI 390-2015 and PMBOK 6 Edition.

Statistical Software Analysis

The questionnaire survey data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 31.0. After coding, the data were entered into the software for statistical processing. The analysis included the calculation of the mean, Relative Importance Index (RII) to measure the level

of importance, Kruskal–Wallis test. PLS-SEM 4 to find out what kind of influence current competencies have on project time performance. These statistical techniques were employed to analyze and interpret the survey findings.

Study participants

The participants in this study consisted of owner-side project managers and employees working in the government construction sector, each with a minimum of eight years of professional experience. Data were collected using a purposive sampling technique. The questionnaire developed from the literature review was validated by five experts, four of whom were from public construction sector institutions and one from academia, with each expert having more than 15 years of relevant experience. Following expert validation, the questionnaire was pilot-tested on seven respondents using a snowball sampling method, after which the main data collection was conducted through purposive sampling involving 65 respondents.

Table 2. Survey Respondent Characteristic

Academic Qualification	Frequency	Percentage
Diploma	1	1,54 %
Bachelor of science	38	58,46 %
Bachelor of social	21	32,31 %
Magister	5	7,69 %
Doctoral	0	0,00 %

Source: Processed Data, 2026

III. RESULT

The project manager competencies presented in Table 1 were incorporated into the questionnaire survey to identify the most critical competencies required of owner-side project managers leading public construction projects in Indonesia. These competencies were then ranked according to their level of importance. Of the 34 competencies assessed, 28 were classified as highly important. Table 3 provides a detailed description of the competencies considered essential for owner project managers..

According to the findings from 65 respondents,

the five most important competencies of project managers owner that contribute to improving project time performance are project integration management, respond to adapt and change, helping relationship/ culture and values, quality management, and scheduling and planning management.

These finding align with [23] Project integration management is a critical competency in construction because the effective integration of processes, people, knowledge, supply chain activities, and change significantly improves project management performance, particularly in terms of time. The ability to respond to adapt and change is an essential project management competency, as project managers are required to deal with uncertain and unpredictable situations, while construction project managers must continuously update and broaden their competencies to remain effective in a changing industry environment [24,25]. Helping relationship are important competencies in construction project management because project managers play a critical role in relationship management, while cultural factors contribute positively to project performance [26,27]. Planning and scheduling competence remains fundamental in construction project management [28,29]

Table 3. Importance level of project manager owner competencies

Competencies	RII	Ranking
X1.1	0,85	1
X2.14	0,834	2
X2.15	0,831	3
X1.7	0,817	4
X1.3	0,815	5
X1.2	0,813	6
X2.16	0,812	7
X2.2	0,803	8
X2.13	0,803	9
X1.4	0,8	10
X1.11	0,8	11
X2.5	0,8	12
X2.11	0,8	13
X2.12	0,8	14

Competencies	RII	Ranking
X2.1	0,794	15
X2.4	0,788	16
X2.7	0,788	17
X1.16	0,783	18
X2.3	0,775	19
X1.8	0,774	20
X2.9	0,772	21
X1.12	0,771	22
X2.8	0,769	23
X1.10	0,766	24
X1.15	0,766	25
X1.13	0,758	26
X1.6	0,753	27
X2.10	0,748	28
X1.14	0,745	29
X1.9	0,742	30
X1.5	0,74	31
X1.17	0,717	32
X2.6	0,714	33
X2.17	0,705	34

Source: Processed Data, 2026

Based on the data table 4, the most prominently applied competencies of project managers owner are scheduling and planning management, followed by project integration management.

Table 4. The current level of project manager owner competencies

Ranking	Competencies	Mean
1	X1.3	22,20769231
2	X1.1	21,79230769
3	X1.4	21,36153846
4	X1.2	20,99230769
5	X1.16	20,34615385
6	X1.15	20,30769231
7	X1.7	20,01538462
8	X2.5	19,93076923
9	X1.11	19,8
10	X2.4	19,42307692

Ranking	Competencies	Mean
11	X1.14	19,27692308
12	X2.14	18,74615385
13	X1.12	18,63846154
14	X1.13	18,26153846
15	X1.5	18,08461538
16	X2.12	17,96153846
17	X1.9	17,70769231
18	X2.15	17,64615385
19	X2.8	17,61538462
20	X2.11	16,80769231
21	X2.9	16,79230769
22	X1.6	16,60769231
23	X2.13	16,1
24	X2.2	15,82307692
25	X1.10	15,74615385
26	X2.3	15,66153846
27	X2.7	15,57692308
28	X1.8	15,03846154
29	X2.10	14,83846154
30	X2.16	14,78461538
31	X2.1	13,80769231
32	X2.17	13,36153846
33	X1.17	12,06153846
34	X2.6	11,87692308

Source: Processed Data, 2026

Relationship Model Analysis

PLS-SEM was selected in this study because the variables under investigation could not be measured directly. Instead, they were assessed through a set of indicators derived from the integration results. This study involved 34 sub-variables and 77 competency indicators representing the underlying constructs. PLS-SEM enables the simultaneous examination of relationships among latent variables measured indirectly through multiple indicators. In questionnaire-based research such as this study, each indicator is also subject to potential measurement error. It is used to determine how competencies, including both knowledge and skills, influence the improvement of project time

performance.

This model tests the influence of two predictor competence variables are knowledge (X1) and skill (X2) on time performance (Y) as in Figure 1.

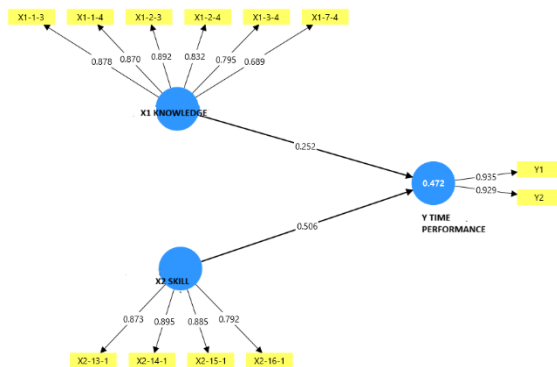


Figure 1. structural model diagram
 Source: Processed Smart-PLS 4 (2026)

The model's predictive ability, as indicated by an R-square value of 0.472, shows that the competency variables were able to explain 47.2% of the variance in project time performance, while the remaining 52.8% was influenced by other factors outside the research model. This is consistent with the findings of Aldossari (2024) [15], which indicate that project performance continues to be influenced by many other variables beyond individual competencies.

Based on the PLS-SEM 4 results, the following competencies were found to have a significant effect on improving project time performance. These competencies include: X1.1.3 (Integration Management Knowledge) namely the ability to direct project implementation in accordance with the plan; X1.1.4 (Integration Management Knowledge) namely the ability to understand project knowledge management, including documenting and recording constraints, problems, and risks encountered during the project as lessons learned for future projects; X1.2.3 (Scope Management Knowledge), namely the ability to monitor project scope regularly to ensure that the work remains within the agreed scope; X1.2.4 (Scope Management Knowledge) namely the ability to carry out the handover of deliverables according to the predetermined and approved type of work; X1.3.4

(Scheduling and Planning Management Knowledge) namely the ability to monitor project timeliness on a regular basis; X1.7.4 (Quality Management Knowledge) namely the ability to understand the implementation process of inspection and quality testing in accordance with established testing methods, including performance testing, acceptance testing, and commissioning; X2.16.1 (Cultural Awareness) namely the ability to manage a diverse workforce by promoting tolerance within the team; X2.15.1 (Helping Relationship/Cultural Value Skill) namely the ability to build and maintain effective working relationships; X2.14.1 (Responding to Change and Adaptation Skill), namely the ability to quickly adjust working methods in response to changes in project needs; and X2.13.1 (Developing Others Skill), namely the ability to guide project team members through directed feedback.

In the data Fig.1, the results of PLS SEM 4 bootstrapping are as below.

Table 5. Bootstrapping results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)
X1 Knowledge -> Y Time performance	0.252	0.268	0.094
X2 Skill -> Y Time performance	0.506	0.509	0.088

Source: SEM-PLS Processed Output, 2026

The influence of the relationship between the two variables is obtained

Table 6. Bootstrapping P-values results

	T statistics	P values	Result
X1 Knowledge -> Y Time performance	2.678	0.007	Significant

X2 Skill -> Y Time performance	5.757	0.000	Significant
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Source: SEM-PLS Processed Output, 2026

X2 (Skills) had a positive, strongest, and highly significant effect on Y (Time Performance), whereas X1 (Knowledge) also had a positive and significant effect, but it was weaker than that of Skills.

This is aligned with the findings of Aldossari (2024) [15], who reported that skill competence has a stronger influence than knowledge competence on the success of project management in the public construction sector.

f – square

Based on table 6, Skills (X2) were the most influential variable and made the greatest contribution to improving project time performance. The effect size of the Skills variable was greater than that of the Knowledge variable, indicating that skills had a stronger influence and a larger contribution to enhancing project time performance than knowledge.

Table 7. Bootstrapping P-values results

f^2 X1 → Y = 0,078
f^2 X2 → Y = 0,313

Source: SEM-PLS Processed Output, 2026

This finding is consistent with Aldossari (2024) [15], who reported that skill-based competence is more dominant than knowledge-based competence in determining the success of construction projects.

Validity and Reliability Test

Table 8. AVE, Cronbach's Alpha and Composite Reliability Results

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE	Result

X1 Knowledge	0.907	0.910	0.929	0.687	Valid
X2 Skill	0.885	0.899	0.920	0.743	Valid
Y Time Performance	0.849	0.850	0.930	0.869	Valid

Source: SEM-PLS Processed Output, 2026

According to Ghazali (2015)[30] *the rule of thumb* commonly used to assess convergent validity is that the loading factor value must be more than 0.7 for confirmatory research and the average variance extracted (AVE) value must be greater than 0.5. Based on the table above, the Average Variance Extracted (AVE) value for each construct is > 0.5, so it can be said that the construct is valid. Furthermore, the Cronbach's alpha value for each construct is > 0.7 and the composite reliability for each construct is > 0.7. Therefore, it can be concluded that all constructs are reliable.

IV. CONCLUSION

This study developed a set of competencies derived from the integration of SKKNI 390-2015 as the local standard and PMBOK 6th Edition (2017) as the international standard. This study shows that the highest levels of competency implementation were found in scheduling and planning management, as well as project integration management, both of which were also included among the five most important competencies. These key competencies consisted of project integration management, the ability to respond to change and adapt, helping relationships/cultural values, quality management, and scheduling and planning management.

One of the main strengths of this study is that it identifies specific skill-based competencies that need to be improved in order to enhance the time performance of owner project managers. Under limited time conditions, improving skill-based competencies should be prioritized over knowledge-based competencies, as skills demonstrated a larger effect size on project time performance. These include cultural awareness, helping relationships, responding to change and

adapt, and developing others. This finding has practical implications for field application, particularly in strengthening the skills of owner project managers in these competencies in developing countries such as Indonesia. This is especially important because time performance in public-sector construction projects tends to be more complex and differs from that in the private sector due to the involvement of multiple stakeholders, high levels of accountability, and layered supervision processes [31]. Public-sector projects are also highly sensitive to budget changes [32], such as those related to regional government budgets, and they face specific challenges such as bureaucracy, regulation, and more complex decision-making processes compared with the private sector [33]. These skills can be improved through training programs and professional courses.

This study also has limitations, as the competency variables were confined to knowledge and skills only. Future research is therefore expected to incorporate additional competency variables in order to provide a more comprehensive understanding of the factors influencing project time performance.

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