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IDENTIFY THE ROLE OF THE OWNER'S ASSISTANT CONSULTANT IN GOVERNMENT BUILDING CONSTRUCTION PROJECTS DURING THE TECHNICAL PLANNING STAGE

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ABSTRACT

The owner's ability to provide information and decide design problems during the technical planning period will determine the success of the project. Owners or commitment making officials (PPK) in ministries or non-technical government institutions according to survey results require assistance in the technical planning process. Assistance by consultants, technical managers or technical teams from both internal and external Government organizations needs to identify their role in order to improve the quality of technical documents. Assistance is needed to empower the role of non-technical owners in traditional delivery systems, especially for complex types of work such as buildings. By using a literature review and content validity analysis as well as the relative importance index (RII) of the opinions of 11 experts, we succeeded in identifying the role of experts as consultants accompanying owners who are really needed in the technical planning process for the success of Government construction projects. There are 5 dominant roles for the owner's assistant, namely ensuring the project brief or TOR is complete and clear, suggesting a list of rules and standard guidelines to be used, helping identify the owner's needs, helping document the results of discussions/briefings, and assisting communication between the owner and the design team.

KEY WORDS

Owner's ability, owner's accompanying consultant, technical planning, construction project.

The quality of construction project technical planning documents is the most important part, but so far problems have always arisen in the form of poor or poor quality (P. D. K. Agbaxode, 2021). The quality of the design document is stated to be no consistent, inaccurate and there have been significant errors over the years (Andi & Minato, 2003; Paul A. Tilley et al., 2002). In the construction industry in general, technical document products are still not prepared effectively and the results do not meet the owner's actual needs, so improvement efforts are needed (Tuhacek & Svoboda, 2019).

The quality of design documentation in practice is indicated by differences between drawings, specifications, volume lists, tender documents and contracts that are poorly written and prepared, conflicting information and inadequate details (P. A. Tilley et al., 1999)(Prasetya & Susetyarto, 2018) (Akampurira & Windapo, 2018). In Indonesia, the quality of project design documents is considered to be poor due to the project planning and preparation process experiencing coordination problems between the institutions and stakeholders involved, initial project information showing that several aspects of feasibility are still lacking, design documents do not meet standards so that investors are less interested in investing (Wahyu Utomo KPPIP, 2017). Poor planning quality also occurred in the so-called Jakarta-Bandung high-speed train strategic project *Planning Fallacy* (Kristiana, DetikNews, 2021). Consulting services in Indonesia experience various problems, including planning consultants, including the limited number of engineers, uneven distribution, competency requirements not accompanied by serious testing (Tamin et al., 2015).

Frequent design changes due to poor technical documents cause inefficiencies in construction projects and can lead to construction failure (Gamil and Abdul Rahman, 2020). Construction project performance is often measured by the occurrence of contract changes which have an impact on delays and cost over-runs originating from design changes resulting from poor design document quality (Jamaludin et al., 2014) (Chakra, 2019),



(Alshdiefat & Aziz, 2018), (Arantes & Ferreira, 2020) (Matusala Bassa, 2020). Inaccurate and incomplete design documents are also the main cause of design changes in construction projects in Malaysia which cause 5-20% increase in costs and project implementation time (Yap & Skitmore, 2018). The impact of poor design technical documents also leads to rework (*rework*), bad work, disputes (Philips Ryder et al, 2013; Love et al, 2010 ; Lopez et al, 2010) incorrect quantity/volume lists (Laryea, 2011; Akintoye and Fitzgerald, 2000) inaccurate project mark-up (Liu and Ling, 2005).

The success of a construction project is determined by accurately prepared design documentation (Abdallah et al, 2018). Factors that influence the quality of design documents come from the owner and design consultant, and these factors are identified as factors related to design documentation, related to collaboration, and related to external factors (P. D. K. Agbaxode, 2021). The quality of design documents is greatly influenced by the level of professional services provided by consultants, this will be related to the way their services are selected and the fees paid to them (Paul A. Tilley et al., 2002). Consultants are companies that seek profits from providing their services so they will try to reduce expenses from paying for personnel and the number of meetings held, while owners, on the other hand, tend to want to minimize production costs for their activities, including consultant fees (Clark, 2005). To assist the owner in the discussion process with the planning consultant as well as carrying out planning supervision, for large and complex project categories, the owner can use the services of a construction management consultant (PP 16, 2021) or use professional assistance in the form of experts or a technical team to assist in the process of preparing design documents technical or *detailed engineering design* (DED) as companion to the owner (PerLKPP 12, 2021).

Project owners in government agencies called service users or Commitment Making Officials (Moh Nur Sholeh, 2020) do not always have a background in the construction sector (*novice client*) and the competency requirements for Commitment Making Officials (PPK) are also not required to have technical background knowledge and experience (PerLKPP 7, 2021). Limited expert resources from government or private project owner staff will consider using professional services from outside the owner's organization (Iman Soeharto, 2001). The construction owner or PPK can be assisted by a Technical Team and/or Expert Team in carrying out their duties. In addition, they can apply for assistance from technical management staff from technical agencies to assist the process at each stage of the project (PUPR Ministerial Decree 22, 2018). The use of a team of experts by the owner (PerLKPP 12, 2021) can improve the quality or design performance on industrial projects in terms of their role in assisting the owner in periodic meetings or coordination, preparation of technical specifications, evaluation of product design stages which are influenced by the professional experience of the expert team leader (Yazi Deswan, 2003). The owner's companion can come from within the owner's organization or come from professionals outside the owner's organization in the form of individuals or professional consulting companies (Jawaharnesan & Price, 1997).

The current condition of the competence of project owners or PPKs has not yet reached the ideal level (Puspa Negara et al., 2019), this is proven by the fact that there are still many PPKs who do not have basic level goods/services procurement certificates so this shows that PPK competence is still limited (Hidayat, 2021). Under these conditions, it is important for project owners to obtain assistance services as advisors or representatives of the owner (*representative client*) whose role is to ensure that all owner needs and project requirements are realized in complete and clear technical documents to be guided at the implementation stage (RIBA, 2020). There are two representative owners, namely executive representatives and technical representatives or project managers (Rashid & Ahmad, 2009). However, the owner's representatives can also be external in the form of individual professionals or consulting companies. Eliminating the professional role of the owner will have the potential for planning results that are not in accordance with the owner's actual needs and desires, resulting in changes to the contract resulting from design changes that have an impact. *delay, rework, dispute* between parties involved in the project (Jawaharnesan & Price, 1997).



This research will discuss the role of the owner's accompanying consultant team (KPO) in assisting the process of preparing technical planning documents to obtain quality DED results. Some research, the KPO team has named *consultant briefing* (Windapo & Cloete, 2017), *Architectural programmer* (William M. Peña, 2012), *Client Adviser* (RIBA, 2020), *client representative* (Jawaharnesan & Price, 1997), Technical Team or Expert Team (PerLKPP 11, 2021), and Technical Management (PUPR Ministerial Regulation 22, 2018). The KPO's role is more focused on pre-construction activities, namely up to the DED documents, but to help the success of the project, this role continues to oversee the concept from planning to implementation in the field strictly, not just periodically (Yunianto et al., 2015). Owners are not always able to communicate their needs effectively in terms of building function and performance, they are more many use direct (oral) communication, so some architects recommend that the owner recruit specialist briefing consultants to explore all the owner's needs for making decisions (Bowen, 1999).

There is a lot of research that discusses planning consultants, construction management consultants and supervisory consultants, but very little research is related to owner assistance consultants (KPO), who work at the pre-construction stage, especially the process of preparing design documents. This research will fill this gap by conducting research on the role of KPO in helping prepare technical documents for construction projects with traditional delivery systems. What important roles can be carried out by KPO, who can be recruited by the owner effectively and efficiently as KPO and what factors are taken into consideration in making decisions about using KPO to assist the owner at the design stage (Technical Planning).

METHODS OF RESEARCH

By using literature reviews in previous journals regarding the role of those who assist the owner at the technical planning stage, then asking for expert opinions to obtain validation of the various roles obtained from the literature. The validation results carried out a priority assessment using the relative importance index (RII) method to obtain the role, qualifications and criteria for the use of consultants or assistant staff for owners of government building construction projects.

RESULTS AND DISCUSSION

This section is the most important chapter in the article. The results and discussion section contains at least a description of the findings of the work that discusses its relationship with previous concepts/theories sharply, compares it critically with the work of others, and strengthens ours to correct previous findings. Please highlight the differences between your results or findings and previous publications by other researchers. Data-data that needs to be presented in the form of tables, drawings, sketches, and other illustrations are allowed to be part of the analysis in the article. Presentation of tables, drawings, sketches, and other illustrations is positioned in the middle by providing explanations at the bottom of the table, drawings, sketches, and illustrations.

Outer Model SEM PLS Test results. This outer model test uses four indicators, namely reliability indicators, discriminant validity, internal consistency, and convergent validity (Widarjono, 2015; Haryono, 2017).

Indicator Reliability Test. The indicator reliability test is a test of the validity of an indicator. The reliability indicator is based on outer loading. An indicator is declared valid if it has a loading factor above 0.7 on the targeted construct (Widarjono, 2015; Haryono, 2017). This research model consists of six variables, namely the Role of KPO, Quality of Design Documents, Professional Design Factors, Project Owner Factors, Design Consultant Factors, and Industrial/External Factors. Based on the results of data processing with SmartPLS 3 Software, the outer loadings value in the first data processing model shows that of the 64 indicators, there are indicators that have outer loadings values below 0.7. This shows that these indicators do not pass the reliability indicator test with outer loadings.



So these indicators need to be removed because they cannot be used in this research.

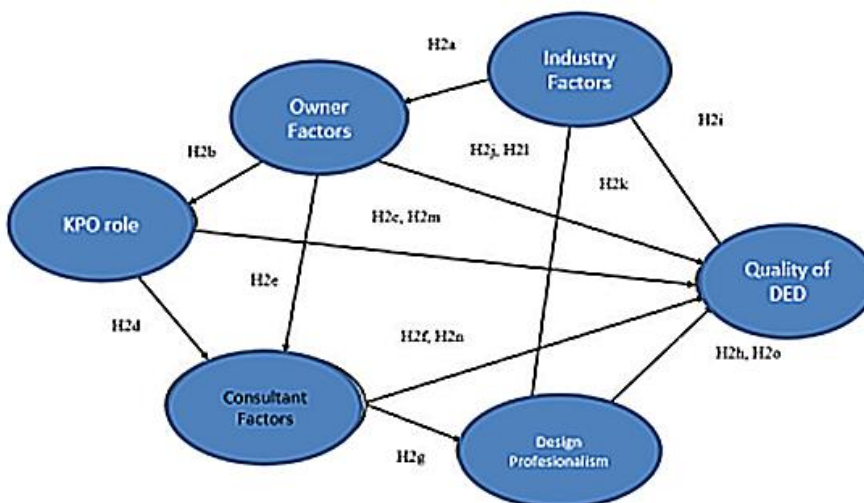


Figure 1 – Conceptual Research Framework

Table 1 is the value results *outer loadings* in the first processing. Looks like there are 17 indicators which have an outer loading value < 0.70 which is visually marked by PLS-SEM in red.

Indicator	Outer Loadings	Decision
CONS1	0,794	Valid
CONS10	0,702	Valid
CONS11	0,824	Valid
CONS12	0,653	Non Valid
CONS13	0,646	Non Valid
CONS15	0,679	Non Valid
CONS2	0,730	Valid
CONS3	0,851	Valid
CONS4	0,756	Valid
CONS5	0,855	Valid
CONS6	0,716	Valid
CONS7	0,763	Valid
CONS8	0,848	Valid
CONS9	0,471	Non Valid
DED1	0,798	Valid
DED10	0,739	Valid
DED2	0,786	Valid
DED3	0,875	Valid
DED4	0,690	Non Valid
DED5	0,769	Valid
DED6	0,699	Non Valid
DED7	0,746	Valid
DED8	0,761	Valid
DED9	0,730	Valid

Figure 2 – Outer Loading First processing

Indikator	Outer Loadings	Keputusan
CONS11	0,824	Valid
CONS2	0,730	Valid
CONS3	0,851	Valid
CONS4	0,756	Valid
CONS5	0,855	Valid
CONS6	0,716	Valid
CONS7	0,763	Valid
CONS8	0,848	Valid
DED1	0,798	Valid
DED10	0,739	Valid
DED2	0,786	Valid
DED3	0,875	Valid
DED5	0,769	Valid
DED7	0,746	Valid
DED8	0,761	Valid
DED9	0,730	Valid
EXT1	0,788	Valid
EXT2	0,848	Valid
EXT6	0,739	Valid
EXT7	0,810	Valid
OWN10	0,735	Valid
OWN11	0,733	Valid
OWN5	0,700	Valid
OWN6	0,815	Valid
OWN8	0,731	Valid
OWN9	0,747	Valid
PD1	0,793	Valid
PD2	0,820	Valid
PD3	0,767	Valid

Figure 3 – Outer Loading Final processing

There are 17 invalid indicators with the following details: There are 4 CONS indicators (CONS12, CONS13, CONS15, and CONS9); 2 DED indicators (DED4, DED6); 4 EXT indicators (EXT3, EXT4, EXT5, and EXT8); and 7 OWN indicators (OWN12, OWN13, OWN14, OWN15, OWN3, OWN4, OWN7). Because there are still 17 indicators that do not meet the requirements for an outer loading value above 0.7, these indicators need to be eliminated starting with the smallest outer loading value until there are no more indicator values below 0.7. All *outer loading* indicator has been > 0.70, until *outer loading* has been done adequately. Chronologically, data processing is carried out 4 times with the first to third processing to eliminate outer loadings values that still have values below 0.7, and the fourth processing to achieve hypothesis proof.



The results of data processing show that all outer loading values in the fourth test have passed the reliability indicator test. Thus, of the 64 indicators in this study, 17 of them were removed because they did not meet the test criteria *indicator reliability*, then 47 indicators remain.

Analysis *inner model* (structural model analysis) is to ensure that the structural model is built *robust* (strong) and accurate. Evaluation *inner model* can be seen from several indicators, which in this study used the multicollinearity test, the coefficient of determination (R^2), which in this study used the multicollinearity test, coefficient of determination (R^2), nilai f^2 (*effect size*), and *Predictive Relevance* (Q^2), and path coefficient (Widarjono, 2015; Haryono, 2017).

From conceptual framework formulated into 15 hypotheses, 11 hypotheses in the form of direct influence and 4 hypotheses in the form of indirect influence. The details are as follows:

Table 1 – Hypothesis Models

No	Hypothesis Model	Decision
1	H-2a: Industrial factors have a positive and significant effect on Project Owner Factors	Positive and significant influence H-2a is proven
2	H-2b: Project Owner Factors have a positive and significant effect on the KPO Role	Positive and significant influence H-2b is proven
3	H-2c: The role of KPO has a positive and significant effect on Design Document Quality.	Positive and significant influence H-2c is proven
4	H-2d: The role of KPO has a positive and significant effect on Consultant Company Factors	Positive and significant influence H-2d is proven
5	H-2e: Project Owner Factors have a positive and significant effect on Consultant Company Factors	Positive and significant influence H-2e is proven
6	H-2f: Consultant Company factors have a positive and significant effect on Quality	Positive and significant influence H-2f proven
7	H-2g: The consulting company factor has a positive and significant effect on the design professional factor	Positive and significant influence H-2g is proven
8	H-2h: Professional Design Factors have a positive and significant effect on Document Quality	Has a negative and insignificant effect H-2h is not proven
9	H-2i: Industrial factors have a positive and significant effect on Design Document Quality	Positive but not significant effect H-2f is not proven
10	H-2j: Project Owner Factors have a positive and significant effect on Quality Design Document	Has a negative and insignificant effect H-2h is not proven
11	H-2k: Industrial Factors have a positive and significant effect on Design Professional Factors	Has a negative and insignificant effect H-2k is not proven
12	H2l: Project Owner Factors mediate at least at the partial mediation level the influence of Industrial Factors on Design Document Quality	Project Owner Factors are proven to mediate the influence of Industrial Factors on Design Document Quality Factors, with full mediation (full mediation) H-2h proven
13	H-2m: The KPO's role is to mediate at least at the partial mediation level the influence of Project Owner Factors on the Quality of Design Documents	The role of KPO is proven to mediate the influence of Project Owner Factors on Design Document Quality Factors, with full mediation (full mediation) H-2m proven
14	H-2n: Consultant Company factors mediate at least at the partial mediation level the influence of the KPO's role on Design Document Quality	Company factors are proven to mediate the influence of the KPO role on design document quality factors, with partial mediation H-2n is proven
15	H-2o: Professional Factors mediate at least at the partial mediation level the influence of the Consultant Design Company Factors	Design Professional Factors are not proven to mediate (no-mediation) the influence of Design Consultant Company Factors on Design Document Quality Factors H-2o is not proven

CONCLUSION

The owner or project owners, in Government projects called PPK, have a very important role in the process of preparing design documents, including preparing a strategic brief or work frame of reference, selecting the design team and providing briefings during the design process to answer design problems so that they are in accordance with the actual needs of the owner and user. PPK non-technical government organizations (non PUPR) at the technical planning stage, apart from being able to use the assistance services of MK consultants for certain work, can also use assistance services from internal organizations



(PUPR) and also from individual consultants in the form of experts according to the fields required by the PPK in design process. The role of the accompanying consultant is differentiated into two periods, namely the pre-design stage and the design stage until a detailed design document or DED is produced.

At the stage before the design process (pre-design), the prominent role of the accompanying consultant to the owner is to prepare a strategic brief or work frame of reference and project schedule, while at the design stage the required role of the accompanying consultant is to ensure that the needs and requirements of the owner and user are accommodated in the planning document. technical aspects, and ensure that the performance of the design team is in accordance with the contract in terms of time, quality of experts and quality of design documentation.

The very important qualifications of consultants accompanying the owner are understanding the characteristics of the owner and user, knowing technical and design aspects and being able to coordinate various parties/stakeholders in the design process. The criteria for using consultants accompanying the owner are the availability of technical personnel in the owner/PPK organization, project characteristics and the procurement delivery system used.

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