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Development of Unit Price Contract Between Main Contractor and Subcontractor in PT XYZ Based on CMBOK to Reduce Claims

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ABSTRACT

The contract management process is an activity in a construction project. The main problem that occurs during the project management process is when the main contractor finds that there are many claims from subcontractors in a project which will cause disputes which will cause delays in the construction process in the field. The main concept of this research is developing a unit price contract process between main contractors and subcontractors to reduce claims on projects. This research was carried out using a risk approach and using the CMBOK 6th edition standardization. Data analysis used the Delphi method and SPSS version 25. The research results stated that, based on expert validation for causes, preventive actions, impacts on the emergence of claims in a project and corrective actions on significant risks that were formed, it was found that the development of a CMBOK-based contract process could be developed through a renewal process and additional activities in a contract process.

Keywords: CMBOK 6th Edition 2019, Construction Project, Contract Management, Risk

INTRODUCTION

To increase economic growth through infrastructure development in Indonesia, the government is making efforts to accelerate projects that are considered strategic and have high urgency so that they can be realized within a short period of time. The beginning of PT XYZ's business process is to create a project proposal. In this activity, management determines the price for tendering and the budget for each project. In the middle phase of project implementation, the project budget often changes to adapt to ongoing project activities. When the project manager proposes budget changes, the project manager must obtain approval from interested parties to obtain approval for changes to the project budget. In implementing this factory project, a unit price contract is used between the service provider and the employer. A construction work contract is the entire contract document that regulates the legal relationship between service users and service providers in providing construction services. Every construction endeavor commences with the aim of successfully executing the project in alignment with the contract specifications. The client, consultant, and contractor all play their respective roles in meeting the project's initial requirements (Tedja & Rarasati, 2021). In Article 1 paragraph (8) UUJK 2017, service users and service providers must follow up written determinations with a construction work contract to guarantee the fulfillment of the rights and obligations of the parties as well as implementing regulations and other regulations that are still in force (Indonesia. The Audit Board, 2017). Construction contract is an important document in a project, because everything related to the rights and obligations between parties as well as risk allocation is regulated in the contract. Its effectiveness is crucial for civil engineers and architects. It is essential for them to gain a comprehensive understanding of the rights and obligations of various stakeholders (owners, designers, contractors, suppliers, sureties, etc.) in construction projects. Additionally, they need to grasp all essential elements within the construction contract, including aspects like scheduling and time management (Ayalp & Öcal, 2016). Therefore, understanding the construction contract is absolutely necessary for the project team so that all problems and risks contained therein can be identified and avoided before work begins.

The impact of disputes between main contractors and subcontractors results in delays occurring on projects and additional costs due to longer work times resulting in a decrease in profits obtained. However, in the implementation of this factory building project using a fixed unit price contract to subcontractors from the main contractor, many claims of additional costs emerged from subcontractors related to material specifications and scope of work which resulted in the contract value increasing. The impact of disputes between main contractors and subcontractors results in delays occurring on projects and additional costs due to longer work times resulting in a decrease in profits obtained.

The increase in construction costs for subcontractors was 4%, namely Rp 6.816.722.130,- from the description of the problems that occurred in the factory project, the cause of the claim occurred because the clauses in the contract had not been written in detail, causing problems when the contract was implemented. The impact of claims is lengthening implementation time, decreasing work productivity, increasing general costs, increasing capital costs (cost of money), decreasing work efficiency, and increasing project resource procurement costs.

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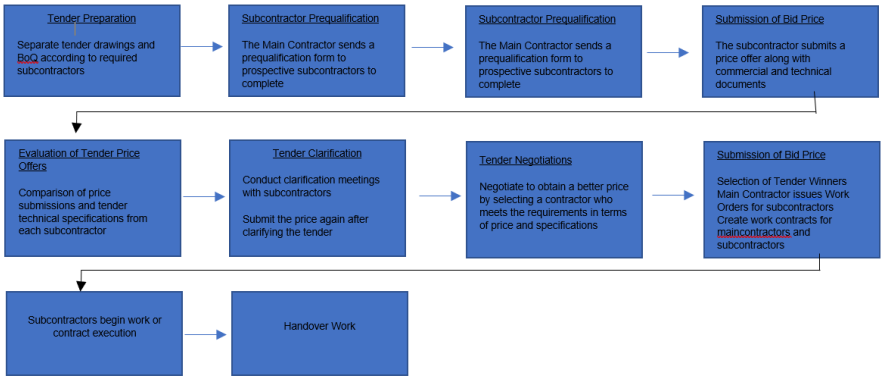
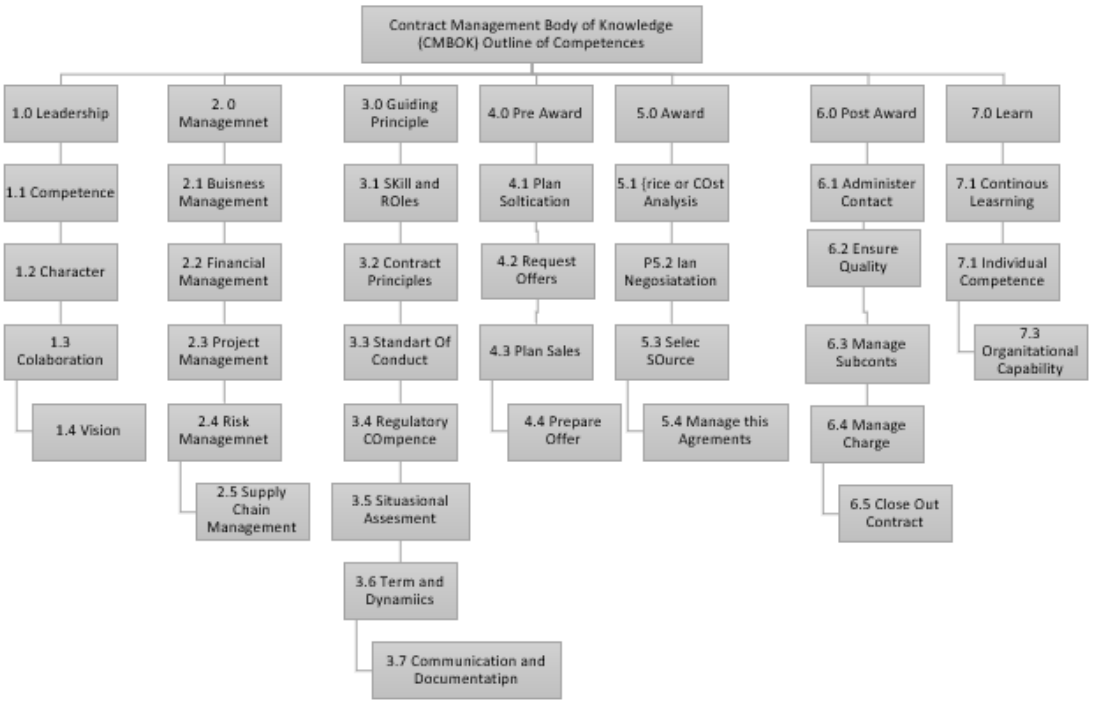
LITERATURE REVIEW

Figure 1. Contract Procurement Process Between Subcontractors and Main Contractors for Home Appliance Factory Projects



According to National Contract Management Association (NCMA, 2020), a contract is mutually binding, which requires the service provider to provide services to service users. For the contract to be valid, both parties must show that they agree with these terms. According to Ronald (2002), contract management is an activity to manage a contract so that the contract can be used as a guide and as a means of controlling work implementation. The concept of contract management is closely linked to the business's operational performance (Muhammad et al., 2019). Meanwhile, according to Ervianto in Fitriani (2008), a contract is the most important element in a collaboration process between various parties to realize a certain goal that has been mutually agreed upon.

Figure 2. Contract Management Body of Knowledge (CMBOK) Outline of Competences



In general, construction projects are considered a sector that is fraught with risk, because of the large construction value and the large number of parties involved (Hansen, 2015). These risks include risks to time (delays in completing work), costs (changes to work so that the construction value increases), and work performance/quality (quality does not meet expectations). The involvement of many parties is also one of the risks of this sector.

To assist contractors in submitting construction claims, a claims management concept is needed which starts with risk allocation in selecting project implementers, construction methods, creating main contracts, subcontracts, and procurement documents, as well as in terms of risk prevention and successful resolution of claims that occur during the project (Bakhary et al., 2013).

Project risk management includes the process of implementing risk management planning, identification, analysis, response planning, response implementation, and risk monitoring on a project (Project Management Institute [PMI], 2023). The aim of project risk management is to increase the likelihood and/or impact of positive risks and to reduce the likelihood and/or impact of negative risks, to optimize the chances of project success. Risks that can occur in the construction of a construction project can be reduced by carrying out risk management. Risk management should be carried out at all stages of the development process, starting from the initial design stage, tendering and contract negotiation stages as well as the construction stage.

The party responsible for resolving the claim and providing a final decision must be clearly stated in the contract. The building owner must check and decide whether the design consultant is also responsible for the events that caused the claim, for example things related to fraud and design imperfections caused by the design consultant. The analysis used is the notice requirements sub-model, the sub-model that corresponds to the claim submission, and the claimed cost and time calculation method.

This states that the variables and indicators identified are valid in influencing the construction delay time have many indicators: project owner, contractor, consultant, share responsibility, and external. Then through qualitative risk analysis and validated by experts, there were ten dominant risk factors for late payment (Auhan, 2022). The development of the contract management system was carried out by adding 18 new activities to the existing contract management system, consisting of eight new activities on bidding procedure, 3 new activities on contract signing procedure and seven new activities on the procedure of implementation and change contract (Yunianto & Rarasati, 2020).

Claims that occur can be resolved in several ways that are mutually agreed upon and stated in the contract, including: engineering judgement, where the design consultant appointed by the building owner is responsible for making the final decision on settling the claim and is binding on all parties; another is negotiation, where the parties those in dispute seek resolution without interference from other parties; then mediation, where the parties to the dispute use a neutral mediator and the decision is not binding; then arbitration, where the disputing party appoints an arbitrator from the arbitration body and the decision is binding; then litigation, where the dispute is brought to court and each party is represented by a lawyer; next is a mini-trial, where the parties to the dispute are represented by each project manager and there is a third party as an advisor; and the last is the dispute review body, where each party to the dispute elects one representative to appoint a third party and the decision is not binding.

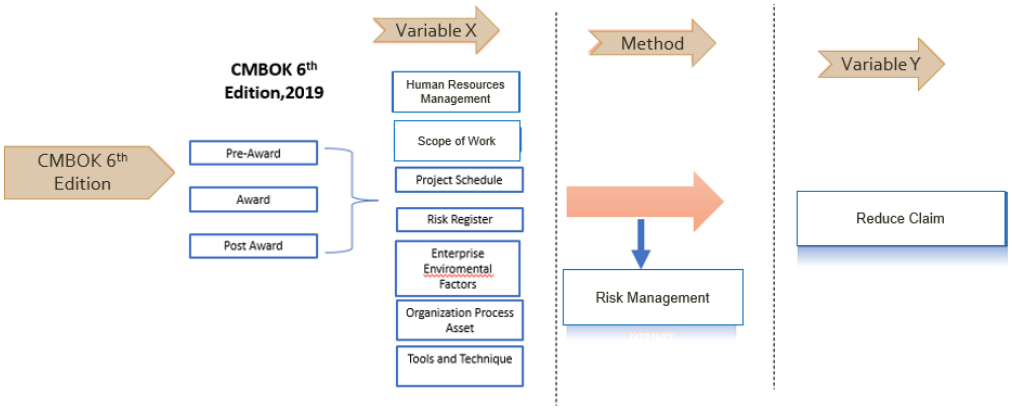
According to the The Great Indonesian Dictionary (KBBI, n.d.), a claim is a demand for recognition of the fact that a person has the right to own or have something. Claiming means requesting or demanding recognition of the fact that someone (an organization, association, country, etc.) has the right to own or possess something. Construction claims are claims arising from or related to the implementation of construction service work between service users and service providers or between main service providers and sub-service providers or material suppliers or between external parties and service users/providers which usually involve requests for additional time and costs or other compensation.

Many studies have stated that one of the causes of claims resulting in disputes on construction projects is poor contract management. According to Arcadis (2015), poor contract management is the main cause of disputes in construction contracts over the years. Hansen (2015) also states that by understanding the role and intricacies of contracts, parties involved in the construction services industry, including contractors, project owners and consultants, can create and negotiate construction contracts in a better and more balanced manner and can prevent, or at least minimize, the emergence of disputes during the implementation of construction work.

This research will be carried out using quantitative methods where the approach taken is based on literature study, filling out questionnaires, and testing theories through measuring research variables. In this research, there are independent variables (variable X) and dependent variables (variable Y) in the research operational model which then produces research hypotheses. Independent variables are variables that are given to an object and maintained so that their treatment of the object does not change, thereby minimizing bias in the research output. The dependent variable is a variable that changes due to the application of the independent variable and is considered as the basis for research results.

The conceptual framework of this research is presented in the following figure.

Figure 3. Conceptual Framework



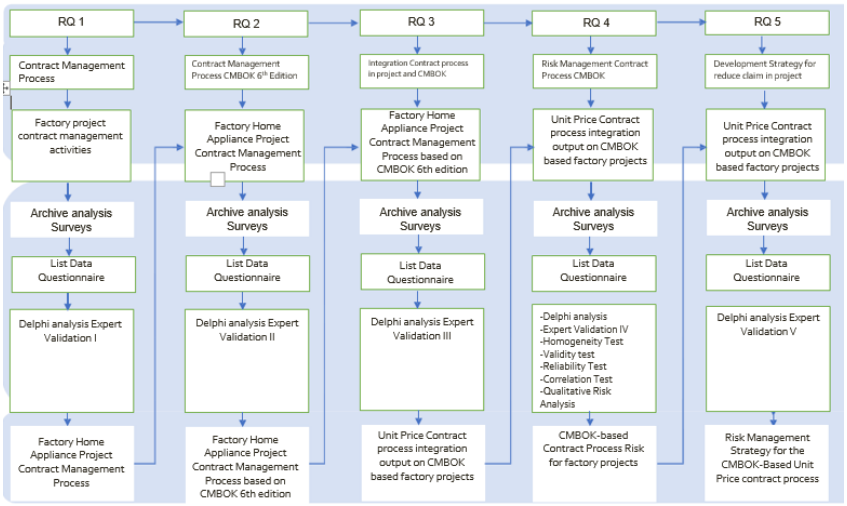
The relationship between the stages of the contract, CMBOK and the risk of contract management on claims can be described as follows. Human resource management influences contract management risks and also includes basic scope management influencing contract management risks, other things are also included project schedule management can influence contract management risk, the influence of company environmental factor management can influence contract management risk, then the organization's asset management process can influence contract management risk and finally, management tools and techniques can influence contract management risk.

Apart from that, indicators for each variable can also help in measuring activities for various kinds of changes that occur. According to Lawrence Green in Notoadmodjo (2005), indicators are variables that indicate certain conditions so that they can be used to measure changes that occur. In this research, the indicators used for variable. Furthermore, the indicators for variable Y are related to construction claims that occur on projects with unit price contracts which will be developed based on Contract Management Body of Knowledge 6th Edition standards.

RESEARCH METHOD

The following are the research stages compiled by the author in conducting this research, where you can see the sequence of work processes used in answering the problem formulations (research questions) that have been explained previously.

Figure 4. Research Flow Diagram



RESULTS

Based on RQ 1 the results of the data analysis that has been carried out, it can be concluded: There are 3 (three) indicators in the contract management process at the project implementation stage, and there are 35 total activities in the contract management process at the implementation stage and there are 15 claim indicators on the project.

Based on RQ 2 the results of the data analysis that has been carried out, it can be concluded: There are 3 (three) indicators in the contract management activity process based on CMBOK 6th Edition which at the project tender stage, there are 13 total activities and 65 sub-activities in the unit price contract process between the main contractor and subcontractors related to the project implementation stage.

Based on RQ 3 the results of the data analysis that has been carried out, it can be concluded that there are 83 total objectives and outputs in the integration of the contract management process within the project and based on CMBOK 6th Edition which relate to contract management for project implementation.

After carrying out factor analysis and regression analysis, the relationship between the dependent variable and the independent variable is obtained:

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Figure 5. Relationship Between the Dependent Variable and the Independent Variable

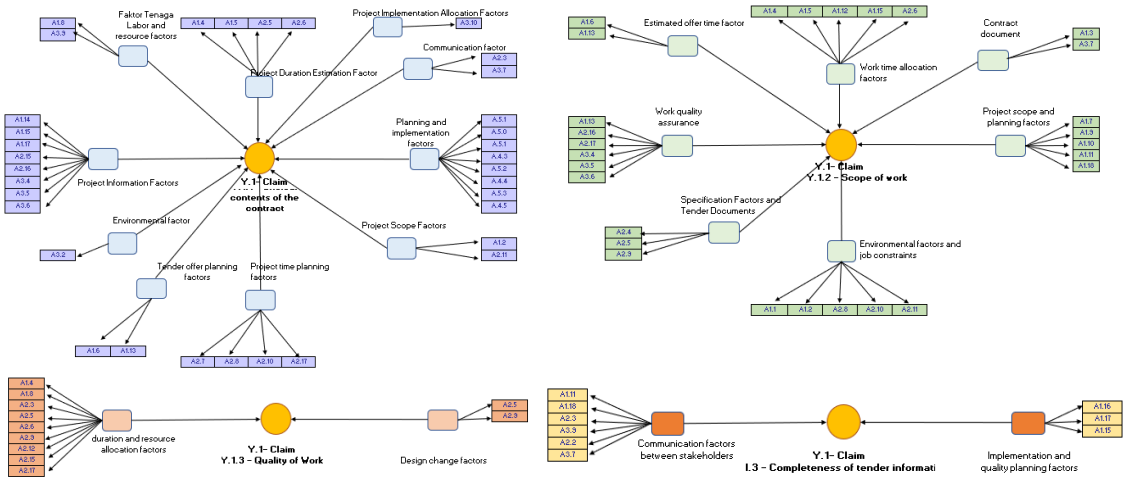

Table 1. Risk Category and Value

Contract Process	Code	Risk Potential	Risk Category and Value
Plan Solicitation	A1.1	The contract value does not match the scope of work	High
Request Offer	A1.9	There was an error in estimating the volume of work	High
	A1.10	Uncertainty of project scope	High
Plan Sales	A1.16	Contractors use inferior materials to gain the advantage of a fixed price, after the bid is completed	High
Prepare offers	A1.18	Lack of owner expertise in choosing the right contractor	High
Price or Cost Analysis	A2.1	The implementation schedule is not in accordance with planning	High
	A2.2	Actual progress in employment is too slow	High
Plan Negotiation	A2.3	Lack of good communication between owner and contractor	High
	A2.4	change the technical specifications of the work according to field needs	High
	A2.5	Changes requested by the owner during the project	High
Select Source	A2.6	The total duration set by the owner is very short	High
	A2.7	The Project Location has not yet been released	High
	A2.8	Job start-time does not match	High
	A2.9	Images and documents do not match	High
	A2.10	Completing work with defective work conditions	High
	A2.11	There is a change in the project scope	High

Contract Process	Code	Risk Potential	Risk Category and Value
	A2.12	Delays in reaching design agreement due to the perception of the owner and design team	High
Closeout Contract	A3.9	Delay in project handover	High

It can be seen in the two tables above that the risks that have a high risk are A1.1, A1.9, A1.10, A1.16, A1.18, A2.1, A2.2, A2.3, A2.4, A2.5, A2.6, A2.7, A2.8, A2.9, A2.10, A2.11, A2.12, and A3.9. Where the eighteen variables come from 3 (three) different management processes, namely pre-award, award, and post award, namely Plan solicitation (A1.1), Request Offer (A1.9 and A1.10), Plan Sales (A1.16), Prepare Offer (A1.18), Price Cost Analysis (A2.1 and A2.2), Plan Negotiation (A2.3, A2.4 and A2.5), Select resources (A2.6, A2 .7, A2.8, A2.9, A2.10, A2.11, A2,12), Close Out Contract (A3.9).

DISCUSSION

In the previous chapter, the researchers explained the indicators for the process of managing unit price contracts between main contractors and subcontractors based on risk-based CMBOK 6th Edition and analysis gaps that occur compared to existing conditions. Validation by experts has been carried out and the level of influence of indicators has been carried out on respondents which results in an analysis of the level of influence. In this chapter, research findings will be discussed and development actions will be discussed. The unit price contract process between the main contractor and existing subcontractors at PT XYZ uses CMBOK 6th edition with three stages, namely: pre-award, award and post award which has 13 sub-activities and 65 activities.

Based on expert validation for causes, preventive actions, impact on the occurrence of claims and corrective actions on significant risks that are formed, it was found that the development of a unit price contract process between main contractors and subcontractors based on CMBOK 6th edition can be developed through a process of adding activities based on CMBOK and updating any changes that occurs in each ongoing process.

Based on the integration of the unit price contract process between the main contractor and subcontractors on the existing condition factory project at PT XYZ against CMBOK 6th edition, it is known that at PT Plan Negotiation, Select Source, Closeout Contract. By identifying risks of risk factors that may occur in the unit price contract process between the main contractor and subcontractors based on CMBOK 6th edition, it is possible to identify the risk factors and dominant risk factors that influence the ambiguity of the contents of the contract, scope of work, quality of work and completeness. Tender information. So, after carrying out an evaluation of the risk response to the existing unit price contract process between main contractors and subcontractors based on CMBOK 6th edition, it can be seen how to improve and develop the process flow in order to reduce claims on the project.

CONCLUSION

Referring to and based on the discussion and analysis of the findings in this research, conclusions can be drawn to meet the objectives and answer the questions in this research as follows.

Based on the first research objective, namely identifying what processes and activities must be included in the unit price contract process between main contractors and subcontractors on factory projects. After the author conducted a literature study and expert validation, it was discovered that the cost and activity estimation process consisted of 3 (three) main processes and a total of 35 activities.

The processes in the unit price contract process between the main contractor and subcontractors based on CMBOK 6th Edition on factory projects are pre-award, award, and post award. The activities for each process were obtained from literature studies and expert validation with a total of 13 sub-activities and 65 activities within them.

Based on the results of the data analysis that has been carried out, in the integration process between existing projects and activity stages in CMBOK 6th Edition, it can be concluded that there are 83 objectives and total outputs in the integration of contract management processes in projects and based on CMBOK 6th Edition which relate to contract management for project implementation.

Potential risks resulting from expert, pilot survey and respondent validation, 41 risks were obtained. After conducting statistical analysis testing on the results of the respondent's questionnaire, it was found that there were 38 potential risks that influenced the emergence of claims on the project based on the unclear contents of the contract in the unit price contract process between the main contractor and subcontractors based on CMBOK 6th edition, namely 38, which influenced the emergence of claims on the project based on the scope of work. as many as 29, which influence the emergence of claims on work quality projects as many as 9, and which influence the emergence of claims on projects based on the completeness of tender information as many as 9. Then the potential risks are grouped based on regression analysis and factors so that the dominant factor group is obtained in the four resource accuracy variables, namely information factors, project scope, project planning and implementation, allocation and resource factors and work quality assurance factors.

Development of the unit price contract process between main contractors and subcontractors based on CMBOK 6th edition is carried out through preventive actions obtained through the author’s analysis based on the literature study process and expert validation. This development takes the form of updating and adding 17 activity outputs to the unit price contract process between main contractors and subcontractors, such as developing activity outputs for making application plans, determining contract types, determining contract methods, formulating contract management strategies, carrying out validation techniques, mitigating risks, determining costs. or price determination originating from the pre-award stage process in a contract. Then price analysis, analysis, forming a negotiation team, knowing what you need to know about the client, carrying out contract negotiation best practices, proposal evaluation techniques, determining the evaluation rating scale, creating negotiation guidelines that originate from the award stage process in a contract, and the last is updating best practices for closing contracts originating from the post award stage process in a contract.

LIMITATION

The shortcomings of this research are: (1) Samples taken from 50 respondents; (2) Data collection in this research only consisted of questionnaire results and primary data; (3) Focus only on risks in the CMBOK-based contract management process to reduce claims; (4) Only focuses on factory projects with private owners.

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DECLARATION OF CONFLICTING INTERESTS
In carrying out this research, researchers experienced difficulty in finding suitable respondents. The reason is, some contract staff do not know about CMBOK 6th edition. Nevertheless, researchers are trying to get representatives and relevant samples. In addition, the researcher stated that there were no conflicts of interest that could influence it objectivity and integrity of this research. This research was carried out with full sincerity and integrity to produce findings that can make a positive contribution to understanding risk-based contract management.

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