



---

## Performance Analysis of Integrated Construction Design and Build in Area of Building Health Building in Dki Jakarta Province-Indonesia

Jujuk Kusumawati<sup>1</sup>, Manlian Ronald. A. Simanjuntak<sup>2</sup>

<sup>1</sup>Post Graduate Program in Construction Management–Universitas Tarumanagara–Indonesia

<sup>2</sup>Professor in Construction Management–Universitas Pelita Harapan Indonesia

---

**Abstract** Since the enactment of Attachment 1 of the Regulation of the Minister of Public Works and People's Housing No. 12 / PRT / M / 2017 on Standards and Guidelines on Procurement of Design and Build Integrated Construction Works, this regulation applies to all government building works either from APBN or APBD. Meanwhile, in the area of Health Building in DKI Jakarta Province, will be rebuilding existing buildings, which means the required construction of integrated construction design (build and build) both for the completion of the construction completed on time. But there are problems that arise in this research is what is the understanding of performance, what are the performance factors and what are the indicators of performance factors in the process of construction implementation. In this research, the research method used is qualitative and comparative method. Qualitative methods use relevant journals, theories and interviews as a guide for research in accordance with the facts in the field. While the comparative method is used to compare the similarities and differences in the results of the implementation of integrated projects design and build. The result of this research is the finding of construction performance factor that is quality, time and cost as well as indicator of each of the construction performance factor.

**Keywords** analysis, performance, integrated construction, building area, health building

---

### 1. Introduction

Since the enactment of Attachment 1 of the Regulation of the Minister of Public Works and People's Housing No. 12 / PRT / M / 2017 on Standards and Guidelines on Procurement of Design and Build Integrated Construction Works, this regulation applies to all government building works either from APBN or APBD. So far, construction service provision for state building is done separately between Stages of Planning and Implementation Stages or commonly referred to as Design-Bid-Build (Design-Build), but in certain work packages there are often work delays due to the procurement system of Design-Build it takes a long time so that the work that depends on 1 (one) year of the budget period will cause impact that is less favorable to the Quality, Time and Cost of the job. It also leads to risk for Construction Management Consultant (MC), Consultant Planner and Executor / contractor. The work will be delayed because the job control performed by the Management Consultant is forced to finish within a very limited time, so that the quality of the work becomes reduced and the cost may not be fully absorbed. It will also result in poor judgment for the image of a construction service provider. Therefore, a good Construction Management Consultant Service is required so that the Design and Build Integrated construction work can run well.

In Integrated Construction Works Design and Build has a relatively sufficient time considering the work of integrated planning and implementation carried out simultaneously both in the process of auction and implementation of its work. Procurement of Construction Service Provider The Constitutional Court Consultant is done early to help prepare the Working Group (Working Group - Procurement Unit). As the Design and Build



project procurement model is still new and all devices are unfamiliar with it will cause many new problems that could affect performance for the Construction Service Provider including Consultant Management Consultant in it.

## 2. Research Problems

Problems to be solved in this research are:

- a. What is the understanding of performance in the construction process?
- b. What are the performance factors in the construction process?
- c. What are the indicators of performance factors in the construction process?

## 3. Literature Review

### 3.1. Implementation Process Constructs Design and Build

Based on Attachment I of the Regulation of the Minister of Public Works and People's Housing Number: 12 / PRT / M / 2017 on Standards and Guidelines for Procurement of Design and Build Integrated Construction Works are all work related to the execution of construction of buildings or other physical establishment, where the planning or design drawing and concurrent construction work. Formulation Process Preparation of the procurement of construction and design integrated construction work (design and build) starts from the identification of the needs of construction work until the announcement of the procurement plan. Design stage in Design and Build method includes two sub-stages: first, Pre-Design stage (Preliminary Design) The result of this stage is used to participate in the tender of Design and Build project. Second, Development stage Design (Design Design) / Detail Design (Detail Design). Which is the development stage of the pre-approved draft is then made in more detailed calculations. Usually the tender for the design and build project is the Contractor who has KSO (Cooperation of Operations) with the Planner.

Entering the Construction Process is the realization of the building required by the project owner and has been designed by the Planner within the agreed cost and time limits, and with the required quality. Activities undertaken at this stage are planning, coordinating and controlling all operations in the field.

### 3.2. Project Performance

Performance has a diverse understanding of economic, welfare, technology, and resources. More performance discussions focus on the output aspect or output of a certain number [1]. Performance is said to be higher if the increase in output is higher than the addition of resources as input factors. Size of performance can be seen based on the aspect of cost, time, and quality in which these three are hereinafter referred to as dimensions of productivity. As with the general performance notion, the performance components for construction projects still depend on aspects of resources that include human resources (HR) and technology. Both of these are then known by the term input in which will be associated with performance dimensions. Construction project workers have a major role or task to combine inputs with specific techniques or skills through a project plan both strategic and operational planning to subsequently produce a construction project. As for the project performance related to cost, time and quality, namely:

#### 1) Project Time Performance

The plan for the implementation of a construction project refers to the estimates that existed at the time the development schedule was made. Problems can arise if there is a discrepancy between the plan that has been made and the implementation in the field. The impact that often happens is the delay in project completion time.

#### 2) Project Cost Performance

Standard cost performance is required to take control measures against the use of existing resources within a project. Reporting on the performance of a project must meet the 5 components of forecasting, actual events, forecasts, variance, and thinking.

#### 3) Project Quality Performance

Quality performance can be defined as an achievement of the quality or quality of products and management that a company can achieve over a period of time. The construction service company must have a good performance in order to create optimal job results. Similarly, the quality of construction projects in order to produce products / services quality to meet the expectations of service users / project owners.



### 3.3. Project Control

Control by R.J. Mockler, as cited by Soeharto (1999: 228) is a systematic effort to set standards in accordance with the goals of planning, designing information systems, comparing execution with standards analyzing the possibility of deviations between implementation and standards, then taking the necessary corrective actions to effectively utilize resources and efficient in order to achieve the target. The control process runs throughout the project life cycle to achieve good performance in every stage. Planning is made as a reference for the implementation of the work. The reference material will then become the implementation standard for the project concerned, including technical specifications, schedule and budget. So to be able to do the necessary control of the planning. In the project control are known some tools to control the implementation of construction work, including :

#### 1) Project Time Control

The length of time of project completion has a major effect on the overall cost of the project. It is therefore required daily / weekly / monthly progress reports to report on job results and completion times for each project work item. And compared with the timing of completion of the plan so that the completion time can be controlled each period.

#### 2) Project Cost Control

Project construction costs need to be grouped in order to calculate earned value. According to Asiyanto [2], Construction cost has the main elements and factors that need to be considered in control activities. The main elements of construction costs are material costs, wage costs and tool costs.

#### 3) Project Quality Control

In the execution of a project, a control is required, in order for the project to be carried out to run properly, in accordance with the planning that has been made in the preparation phase. In the control of a project must meet the quality requirements, which is the objective of project management in addition to schedule and cost. Quality is the nature and characteristics of a product or service that makes it meet the needs of the customer or the customer. Another definition for quality often associated with a project is fitness for use. This term besides has the meaning as described above, also pay attention to the problem of product availability, reliability, and maintenance issues.

### 3.4. Role of the parties in the construction process

In the construction process there is the involvement of the role of the assignor or owner, consultant and contractor so that the construction project goes well without any party being harmed. The role of the parties in the construction process integrated design and build according to Wulfram, 2006 are :

#### 1) The owner

The assignor plays a role in providing project planning and execution costs, organizing project administration, assigning tasks and making work orders (SPK) as well as holding accountable Construction Management Consultants and Contractors who already have KSO (Cooperation of Operations) with Consultants, receiving completed projects undertaken, endorsed or denied changes to the planned work, terminated the working relationship with the project implementer who can not perform his work in accordance with the contents of the contract agreement. for example the implementation of construction with the form and material that is not in accordance with the RKS.

#### 2) Construction Management Consultant

The Construction Management Consultant has several roles, among others, acting as a companion of the work process from the control of the planning stage and the control of the implementation phase, as the Quality Control to maintain the fit between the planning and the implementation, to anticipate the change of uncertain field conditions and overcome the limited time implementation, achievement and progress of the project that has been achieved, it is done with daily, weekly and monthly (daily), evaluation results can be taken as a decision-making action to the problems that occur in the field, managerial role of management is a good information system to analyze performance in the field. As the construction progresses, the planner's consultant can schedule regular meetings with the contractor to discuss what may need to be resolved.



### 3) Consultant Planner

Consultant Planner in integrated project design and build is a consultant who already has KSO (Cooperation of Operations) with Contractor who has been appointed by the assignor to carry out planning work. The Planning Consultant must be a private entity or government. The role of the planner consultant is to adjust the state of the field to the wishes of the building owner, draw up the implementation work drawings, make the Work Plan and the building implementation requirements (RKS) as the implementation guideline, make the budget plan of the building cost, project the owner's wishes or ideas to in the design of the building, make design changes if there are deviations in the implementation of field work that does not allow the design materialized in realize, accountable for the design and calculation of structures in case of construction failure, then the implementation process is submitted to the Contractor.

### 4) Contractor

The appointed contractor in the design and build integrated project is the Contractor who already has KSO (Cooperation of Operations) with the Planner Consultant. Serve as the executor of construction work in accordance with the drawing of planning and schedule that has been made by Construction Management Consultant. Provide manpower, materials, workplaces, equipment, and other supporting equipment used in reference to specified specifications and drawings with due regard to time, cost, quality and job security, as well as full responsibility for construction activities and on-the-job implementation methods.

### 3.5. The results of relevant journal studies

The following are the results of relevant journal studies used in this study: (1) Model for Predicting the Performance of Project Managers at the Construction Phase of Mass House Building Projects [3], the relevant is the measure of the project performance characteristics on the knowledge transfer technology work appropriate for construction; time management practices; the ability to deliver effective solutions to conflict, while maintaining good relationships; ease of cooperation of contractor with project owner; (2) Performance Comparison of Large Design-Build and Design-Bid-Build Highway Projects [4], the relevant thing is Comparing and analyzing the characteristics and performance of projects with the Design-Bid-Build project system with the Design and Build project; 3) Comparison of Cost and Time Performance of Design-Build and Design-Bid-Build Delivery Systems in Florida [5], it is relevant to compare the performance of a Design-Bid-Build project with a Design and Build project in a limited time; (3) Performance Analysis of Construction Manager at Risk on Pipeline Engineering and Construction Projects [6], it is relevant to compare the performance of a Design-Bid-Build project with a Design and Build project in a limited time; (4) Performance Analysis of Construction Manager at Risk on Pipeline Engineering and Construction Projects [6], relevant issues are project performance analysis and comparing statistical costs and work schedules, (5) Using Best-Value Procurement to Measure the Impact of Initial Risk Management Capabilities on Qualitative Construction Performance [7], the relevant thing is the analysis of project management depends on contractual performance or elected. From the results of this relevant research journal will get an indicator of performance factors.

## 4. Research Methodology and Analysis

### 4.1. Research Process

To achieve the purpose of research then conducted a research process which is the sequence of research implementation phase in accordance with the problems and accurate analysis. The research process undertaken is as follows:

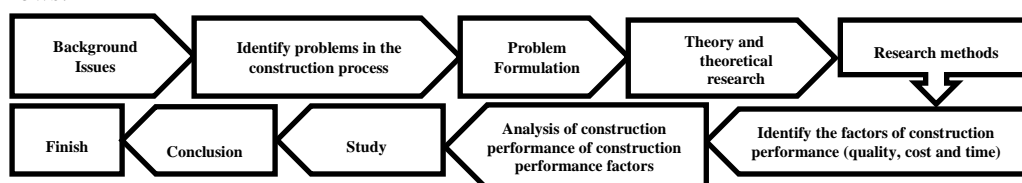


Figure 1: The Research Process

From the background of problems can be identified problems in the implementation of the construction process, which can be obtained formulation of the problem. After reviewing the relevant theories and journals can be



identified the factors of construction performance of quality, cost and time. Which then the performance factors are analyzed to get an indicator of these factors.

#### 4.2. Research Instruments

Research instrument in research there are 2 that is: first (1) Primary Data, which is source of research data obtained from interview with project owner, Construction Management consultant and study from relevant journal. Second (2) Secondary Data in this study obtained through project data and schedule determined by Construction Management consultant [8].

#### 4.3. Research Methods

The research method used is qualitative and comparative method. Qualitative methods use relevant journals, theories and interviews as a guide for research in accordance with the facts in the field. While the comparative method is used to compare the similarities and differences of the results of the implementation of integrated projects design and build which data is in Construction Management Consultant [8].

To determine the performance factor of construction analysis of construction performance of integrated design and build (design and build) in the project building area of Health Building in DKI Jakarta Province conducted interview with project owner and study to relevant journal which research topic, while for the plot is as follows :

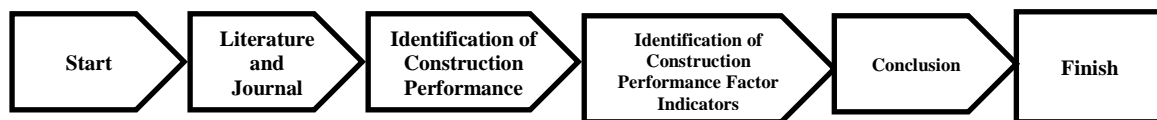


Figure 2: Research Methods

#### 4.4. Analysis

##### 1. Performance Understanding Analysis

From the theoretical study of performance, it is found that the measure of performance can be seen based on the cost, time, and quality aspects in which these three are what are said to be the dimensions of productivity. performance components for construction projects are still based on aspects of resources that include human resources (HR) and technology. Both of these are then known by the term input in which will be associated with performance dimensions.

##### 2. Analysis of Factors of Construction Performance

From the study of five relevant journals and four supporting theories are the factors of construction performance, namely quality, time and cost, which will affect the performance of the construction of the integrated design (build and build).

##### 3. Indicator Analysis of Construction Performance Factors

The indicators of these construction performance factors are derived from the relevant theories and journals studies that are part of the research factor, are first, (1) Quality, that is specification, strength, resilience, quality, assurance, standardization, environmentally friendly, sustainable, size / weight / dose; the second, (2) Cost, that is volume, unit price, worker wage, material price, estimated cost, unit, cost index, unexpected cost, real cost, ppn 10%; the third (3) Time, that is the work schedule, the daily work, the monthly work, the time slot, the maintenance period, the time, the time addendum, the preparation period and the deviation (the time difference).

#### 5. Conclusion

Conclusion of Performance Analysis of Integrated Construction Design and Build (Design And Build) In Project Building Area Health Building In DKI Jakarta Province are:

1. Understanding performance in the process of construction implementation is a measure of performance based on the aspects of cost, time, and quality in which these three are hereinafter referred to as performance dimensions.
2. It can be seen that the performance factors in the implementation process of construction there are three namely quality, time and cost.



3. While the indicators of each of the performance factors ie quality, time and cost in the process of construction implementation there are ten indicators.

#### Reference

- [1]. Sandyavitri A., 2012. *Pengendalian Dampak Perubahan Desain terhadap Waktu dan Pekerjaan Konstruksi*, Disertasi Jurusan Teknik Sipil, Fakultas Teknik, Universitas Riau, Pekanbaru.
- [2]. Asiyanto, 2005, *Manajemen Produksi untuk Jasa Konstruksi*, Pradnya Paramitha, Jakarta.
- [3]. D. K. Ahadzie; D. G. Proverbs; and P. O. Olomolaiye, 2008, *Model for Predicting the Performance of Project Managers at the Construction Phase of Mass House Building Projects*, ASCE.
- [4]. Pramen P. Shrestha, P.E., M.ASCE1; James T. O'Connor, P.E., M.ASCE2; and G. Edward Gibson Jr., P.E., F.ASCE3, 2012, *Performance Comparison of Large Design-Build and Design-Bid-Build Highway Projects*, ASCE.
- [5]. R. Edward Minchin Jr., M.ASCE1; Xiaoxiao Li2; Raja R. Issa, F.ASCE3; and Gary G. Vargas4, 2013, *Comparison of Cost and Time Performance of Design-Build and Design-Bid-Build Delivery Systems in Florida*, ASCE.
- [6]. Tober Francom, Ph.D., A.M.ASCE1; Mounir El Asmar, Ph.D., A.M.ASCE2; and Samuel T. Ariaratnam, Ph.D., P.E., F.ASCE, 2016, *Performance Analysis of Construction Manager at Risk on Pipeline Engineering and Construction Projects*, ASCE
- [7]. Anthony Perrenoud; Brian C. Lines; John Savicky; and Kenneth T. Sullivan, 2017, *Using Best-Value Procurement to Measure the Impact of Initial Risk-Management Capability on Qualitative Construction Performance*, ASCE.
- [8]. Nazir, 2005, *Metode Penelitian*, Ghalia Indonesia, Bogor.

