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Analyzing The Impact of Contract Value, Project Duration, and Number of Floors on Human Resource Costs In The Agenci Dejenvolvementu Nacional Office Construction Project In Dili Using Multiple Regression

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ABSTRACT
This study aims to analyze the influence of building construction project financing, which includes contract value, project duration, and number of floors, on human resource costs (Expert Costs, Skilled Labor Costs, and Worker/Mandor Costs) in building construction projects within the Dili City Government Office. The research focuses on 20 building projects in the Dili City Government Office environment. Using project report documents as data, the independent variables in this study are contract value, project duration, and the number of floors, while the dependent variables are the costs associated with experts, skilled labor, and workers/mandors/laden. The study employs multiple linear regression analysis to assess the relationship between these variables. The results show that the contract value has a significant partial effect on human resource costs, including expert costs, skilled labor costs, and worker/mandor costs. This indicates that a higher contract value influences the allocation of human resource costs in building construction projects. In conclusion, the study highlights the importance of managing contract value, project duration, and the number of floors to optimize human resource costs and ensure efficient project completion.

Introduction

Time and cost play a crucial role in determining the success or failure of a project. A project's success is often measured by its ability to be completed within a short time frame and at minimal costs without compromising work quality. Systematic project management is essential to ensure that project timelines align with contract requirements or are even completed ahead of schedule, thereby optimizing time and cost for maximum profit. Achieving this requires optimizing time and cost by creating a project work network, identifying critical activities, calculating project durations, and determining resource allocation (Prasanda et al., 2017).

However, delays are a common issue in construction projects. This highlights the need for performance evaluation to assess efficiency, the sustainable use of operational costs, and to provide critical information for management decision-making (Putri et al., 2024). Literature indicates that delays are often caused by contractors, such as poor work quality, lack of labor planning experience, and failures in field and financial management. Additionally, project owners frequently contribute to delays through land acquisition issues, design changes, payment delays, and material shortages. Regardless of the causes, delays typically result in significant impacts, including cost overruns, schedule adjustments, and potential fines for contractors (Rompas, 2022).

Managing project resources—such as labor, equipment, materials (both fixed and temporary), supplies, facilities, funds, technology, methods, and time—is critical to ensuring project completion within budget and quality standards (Barrie et al., 1994). Larger activities with more complex mechanisms often encounter greater challenges. If not properly managed, these issues can lead to delays, quality deviations, cost overruns, resource wastage, unhealthy competition among implementers, and failure to meet the intended facility objectives (Dipohusodo, 1996).

Effective project management is key to overcoming these challenges. The process of controlling a project encompasses all activities within the project life cycle. Completing a project requires implementing a control system that considers resources such as time, cost, and project performance to maintain oversight (Pramadha et al., 2024). Project management involves planning, implementing, and controlling activities to meet objectives within time, cost, and quality constraints. These three fundamental elements of project management—time, cost, and quality—are interdependent and must be managed optimally. Time pertains to scheduling activities, cost involves managing funds and resources, and quality ensures that project deliverables meet specified standards (Rumengan et al., 2019).

Integrated management of time, cost, and quality requires systematic application of methods. In this study, the statistical method of multiple linear regression was used to understand the relationship between time, cost, and quality factors on human resources in development projects in Dili City (Lesar et al., 2022). Multiple linear regression was chosen because it can model the relationship between several independent variables (such as the cost of experts, skilled labor, and workers) and dependent variables (such as project duration and quality of results). According to Montgomery et al. (2012), Linear Regression can be defined as “a statistical method that models the linear relationship between a dependent variable and one or more independent variables”. Meanwhile, according to Kutner et al. (2005) Linear Regression is “a statistical tool used to study the relationship between a dependent variable and one or more independent variables”. Basically, multiple regression is a development of ordinary least-squares (OLS) regression because it involves more than one variable (PANGESTU, 2023).

Facilities and infrastructure development projects in Dili City that are implemented by the government in collaboration with the private sector often face additional cost challenges due to customization needs. Therefore, efficient resource management is needed to achieve the project completion target on time, within budget, and meet the set quality standards. This approach is expected to provide a comprehensive solution to the challenges of the Agenci Dejenvolvementu Nacional (ADN) Building construction project in Dili City, Timor Leste (Adi et al., 2016).

Problem Formulation

From the background above, the following problem formulation can be made: How does the cost of building construction projects consisting of contract value, project duration, number of floors persially affect the cost of human resources in the construction project of the Agenci Dejenvolvementu Nacional Office Building in Dili City?

Research Objectives

The objectives of this research are as follows: Analyzing the effect of building construction project financing consisting of contract value, project duration, and number of floors persially on human resources in the construction project of the Agenci Dejenvolvementu Nacional Office Building in Dili City.

Literature Review

Activity/Project

A project is a series of activities that have specific objectives, with clear time, cost, and resource constraints. Some project definitions from experts and trusted sources include:

a. According to the Project Management Institute (PMI): A project is a temporary endeavor undertaken to create a unique product, service, or result.
b. Definition from Kerzner (2009): A project can be defined as a set of activities and tasks that:
    1. Have a specific goal to accomplish within certain specifications
    2. Has a defined start and end date
    3. Have funding restrictions (if applicable)
    4. Consume human and non-human resources (i.e. money, people, equipment)
    5. Multifunctional (crossing multiple functional lines)

Project types can be grouped based on the main activity components and end results, namely:

1. Construction Project; The result is the construction of bridges, buildings, roads, etc.
2. Manufacturing Industry Project; Activities ranging from designing to the creation of a new product.
3. Research and Development Project; Conducting research and development until the creation of a particular product with the aim of improving or enhancing a particular product, service or method.
4. Capital Intensive Project; A project that requires large capital, for example: Land acquisition, purchase and procurement of goods, construction of a production facility, and so on.
5. New product development projects; a combination of research and development projects and capital-intensive projects.
6. Management service projects; relate to non-physical facilities or services of the company. For example, the development of the company's information system, increasing the productivity of employees, and so on.
7. Infrastructure Projects; Providing the needs of the wider community in terms of transportation infrastructure, reservoirs, power plants, telecommunications installations and the provision of drinking water sources.

Types of Construction Projects

Construction projects develop in line with the development and advancement of technology. The fields of human life are increasingly diverse, demanding the construction services industry construction projects that suit these needs. Construction

projects for office or school buildings and housing will be very different from the construction of factory buildings, as well as the construction of dams, bridges, roads, and other civil projects. In this research, several types of construction will be reviewed to model the proportion of construction project resources, including building construction, road construction, and bridges (Sandika, 2018).

Building construction projects include office buildings, schools, shops, hospitals, residences, and others. In accordance with the definition stated in the Regulation of the Minister of Public Works No. 57/PRT/1991 of 1991, what is meant by a building is a building erected in an environment partly or wholly on or in land / water permanently which functions as a place for humans to carry out their activities. A building at the construction stage can be interpreted as a temporary factory that employs the resources necessary to achieve its contract objectives.

Construction Project Resources

Resources are required to carry out the works that constitute the Project components. This is done in relation to the accuracy of the calculation of the elements of cost, quality, and time. How to process (in terms of effectiveness and efficiency) the use of these resources will have an impact on the cost and schedule of implementation of the work. Specifically in terms of resources, the project wants resources to be available in sufficient quality and quantity in time. Optimally used and mobilized as soon as they are not needed (Dewi & Komara, 2023).

In general, resources are a potential ability and capacity that can be utilized by human activities for socio-economic activities. So that more specifically it can be stated that construction project resources are potential capabilities and capacities that can be utilized for construction strength. Construction project resources consist of several types including cost, time, human resources, materials, and also equipment used in project implementation, where in operating these resources need to be carried out in a good management system so that they can be utilized optimally.

Time

Time is a major resource in the implementation of a project. Planning and controlling time is done by setting a schedule, namely by identifying the point when work starts and when it ends. Planning and control is part of costing. In this relationship, project managers often assume that the faster the project completion the better. However, in reality, time planning must be calculated based on the *man-hour* of the cost estimate, it can be used as a basis for calculating the length of activities on the schedule. So that the use of time can be optimized.

Cost

Cost is the initial capital for the procurement of a construction. Where costs can be defined as the sum of all efforts and expenses made in developing, producing, and applying products. Product producers always think about the consequences of costs on quality, reliability, and *maintainability* because this will affect the cost for the user. Production costs are very noteworthy because they often contain several necessary costs. In determining the cost of a job or procurement, it is not always necessary to be guided by the absolute lowest price.

Human Resources

To realize the project scope into *deliverables,* resources are also needed. Human resource management includes the process of planning and using human resources in an appropriate (*effective*) way to obtain optimal results. Resources can be in the form of *human* (Labor, experts, and skilled personnel), which consists of (based on Guidelines

for Improving the Professionalism of Construction Human Resources, 2007):

1. Construction Labor

   Construction labor is the largest portion of construction projects. While Human Resources are actors of work in the field of construction consisting of planning, executors, and supervisors. According to Sugiono (2016) construction labor is divided into two types, namely providers or supervisors and workers or *craft* labor. The number of providers is only 5-10% of the number of workers supervised. In addition, when viewed from the form of labor relations between the parties concerned, project labor, especially construction labor, can be divided into two, namely:

   a. Direct hire, i.e. workers who are recruited and sign an individual employment bond with the contracting company, followed by training, until they are considered to have sufficient knowledge and skills.
   b. Borongan labor, namely labor whose work is based on a work bond between a labor supplier company and the Contractor, for a certain period of time.

To meet labor requirements, with an eye to balancing the amount and work available, contractors generally choose to combine direct labor with piecework labor. Meanwhile, skilled supervisors will be retained despite the low volume of work.

2. Construction Labor Planning

According to Soeharto (1999) in project implementation, human resources in the form of labor are a determining factor in the success of a project. The type and intensity of project activities change rapidly throughout the cycle, so that the provision of labor must include estimates of the type and when labor is needed. By knowing the estimated number and schedule of needs, the provision of human resources both in quality and quantity is better and more efficient.

Furthermore, Suharto emphasized that theoretically, the average need for labor can be calculated from the total scope of project work expressed in man-hours divided by the project period. However, this way is less efficient because it is not in accordance with reality, because it will cause waste by bringing in all labor needs at the beginning of the project. Thus, in planning a realistic amount of project labor, it is necessary to consider various factors, namely labor productivity, limited resources, the number of construction workers in the field and the leveling of the number of workers to prevent sharp *fluctuations*.

Project Cost Distribution

Project cost distribution refers to the allocation and division of total project costs into various categories or components. A good understanding of project cost distribution is essential for effective financial management and informed decision-making. Except in special cases, such as expansion projects to build additional units that are applications of existing units, in general, each project is technically quite different. This situation directly affects the cost distribution of the capital element.

Financing Information

In planning project financing, data and information obtained from various sources are collected, studied, and processed to produce specific or similar correlation graphs. In addition, there is data and information from previous similar projects that are not too old and are useful as a guide or reference for making a cost estimate. Such data and information are generally not difficult to adjust. Adjustments made include matters related to escalation and changes (additions or subtractions) in the project scope. In addition, it is necessary to examine whether the previous project was built in an efficient

and economical way, so that the figures concerned are quite realistic. So, what needs to be considered is:

Project Objectives and Constraints

In the process of achieving these goals, the limits have been set, namely the amount of money (budget) allocated and the schedule and quality that must be met. These three limits are called the three constraints.

a. Budget

Activities must be completed at a cost that does not exceed the budget for projects involving large amounts of funds and the multi-year schedule of the budget is not only determined for the total project but is broken down into components, or a certain period whose amount is adjusted as needed. Thus, the completion of parts of the project must also meet the budget objectives of the period.

b. Schedule

Activities must be carried out in accordance with the specified timeframe and end date. If the result is to be able to produce new products, the delivery must not exceed the specified time.

c. Quality

The product or result of project activities must meet quality requirements, meaning that it is able to fulfill the intended task or often referred to as fit for the intended use. The above limitation activities are tug-of-war in nature, meaning that if it improves the performance of the product agreed upon in the contract, it must generally be followed by an increase in quality, which in turn results in an increase in costs beyond the budget (Soeharto, 2001).

Project Management

Project management is the application of science, expertise and skills, the best technical means and with limited resources to achieve predetermined goals in order to obtain optimal results in terms of performance, time, quality and safety. In project management, the need for good and directed management because a project has limitations so that the goal of a project can be achieved. What needs to be managed in the project management area is cost, quality, time, occupational health and safety, resources, environment, risk and information systems. There are three broad lines to create the ongoing of a project, namely:

1. Planning

To achieve the goal, a project needs careful planning. That is by laying the foundation of the goals and objectives of a project as well as preparing all technical and administrative programs so that they can be implemented. The goal is to meet the requirements of the specified specifications within the limits of time, quality, cost and safety. Project planning is carried out by means of feasibility studies, value engineering, project management area planning (cost, quality, time, occupational health and safety, resources, environment, risk and information systems).

2. Scheduling

It is the implementation of planning that can provide information about the planned schedule and progress of the project which includes resources (cost, labor, equipment, materials,) duration and time progress to complete the project. Project scheduling follows the development of the project with its various problems. The process of monitoring and updating is always carried out to get realistic scheduling to match the project objectives. There are several methods for managing project scheduling, namely the S curve (*Hanumm Curve*), *Barchat*, Linear scheduling (Vector

diagram), *Network Planning* and activity duration time. If there is a deviation from the original plan, evaluation and corrective actions are taken so that the project remains on the desired path.

3. Project Control

Control affects the outcome of a project. The main goal is to minimize any deviations that may occur during the project. The objectives of project control, namely optimization of cost, time, quality and safety performance, must have criteria as benchmarks. Activities carried out in the control process are in the form of supervision, inspection, correction carried out during the implementation process.

Construction Activities

Construction activities are the process by which plans/designs and specifications are converted into physical structures and facilities. The construction process involves the organization and coordination of all project/activity resources (manpower, construction equipment, permanent and temporary materials, supplies and facilities, money, technology, and time methods) to complete the project on time, within budget, and in accordance with the quality and performance standards specified by the planner.

Construction has entered almost all areas of human life and the diverse nature of these areas through its projects. Playing a major role in the construction process are contractors and subcontractors along with labor, architects, engineers, as material and equipment suppliers, project owners and transportation service providers (Barrie, 1993)[3].

In construction work there are 4 targets that must be achieved by the contractor, namely:

a. Completed to a quality at least equal to that specified in the plans.
b. Completed with time ≤ planning time
c. Completed with cost ≤ planned cost
d. Done with no environmental impact (social, physical, and administrative)

Construction Project Control

Control is needed to maintain conformity between planners and implementers. Every work carried out must be thoroughly inspected and checked by the field supervisor, whether it is in accordance with the specifications or not. For example, the lifting of materials must be well organized, and the materials ordered must be tested in advance at each factory. With good planning and control of existing activities, the occurrence of schedule delays that result in project cost overruns can be avoided.

The control process runs throughout the project life cycle to realize good performance at every stage. Planning is made as a reference material for job executors. The reference material will then become the standard of implementation on the project concerned, including techniques, schedules, and budgets (Ervianto, 2004). The construction project control process is related to many factors that affect each other.

There are three assessments of the quality of a construction project/activity, namely the assessment of the physical quality of construction, cost and time. The construction physical quality control division is separate from the schedule and cost control division. Construction quality control is carried out separately by engineering supervisors through plan drawings and technical specifications. Schedule and cost control is included in the project management division which includes monitoring the progress of work (progress) cost reduction, optimization, modeling and analysis (Ervianto, 2004).

The bigger a project is, the more complex the mechanism is so that the more

problems must be faced. If not handled properly, various problems will result in delays in project completion, deviations in the quality of results, inflated costs, waste of resources, unhealthy competition among implementers, and failure to achieve goals and objectives. Therefore, directed control of construction projects will be achieved if the goals, objectives and implementation techniques of each work are clearly stated and detailed (Dispohusodo, 1994)[(4).]

Project Activity Stages

The stages of project activities can be divided into two, namely, the preparation stage and the implementation stage. For details The preparatory activity stage includes:

1. Project idea identification or preliminary analysis
2. Development of ideas into alternative concepts
3. Evaluate the feasibility of alternative concepts from all aspects
4. Determination of good alternative concepts
5. Identification of required resources and implementation schedule
6. Develop a cost estimate
7. Develop an implementation organization

The implementer stage is characterized by project activities that include:

1. Prepare detailed engineering designs for material procurement and construction activities
2. Develop a definitive budget and master project schedule
3. Manpower procurement and mobilization
4. Purchase of materials and equipment including manufacturing
5. Construction completion, pre-operation and start-up

Elements of Activity Preparation

The logical organization of activities according to time, will result in a formal plan that includes:

a) Activities or tasks
b) Time
c) Source:
d) Cost, as a target for future implementation

Cost Management

In the implementation of Construction, the cost factor is a major consideration because it usually involves a large amount of investment that must be invested by the assignor which is vulnerable to the risk of failure. Therefore, project costs need to be managed properly so that the possibility of additional costs can be minimized.

Project Cost

Project costs are the costs required for each job in completing a project. Broadly speaking, the cost of project activities can be divided into 2 parts, namely:

a. Direct Costs

Direct costs are costs for everything that will be a permanent component of the final result of a project (Soeharto, 1995). Direct costs consist of costs that are directly related to construction or a particular project, including material cost, labor wages, equipment cost, sub-contractor fees

b. Indirect Costs

Indirect costs are expenditures for management, supervision and payment for materials and services for the procurement of project parts that will not be installed in permanent products but are necessary for the construction of the project (Soeharto, 1995). Indirect costs consist of overhead costs, unexpected costs, profit,

penalties/bonuses. under certain circumstances, penalties and bonuses can be considered as indirect costs that can affect overall costs (Nancy Mingus, 2002).

Direct and indirect costs together form the cost of the project, so there is cost control and estimation, and these two types of costs need to be considered. Both direct and indirect costs will change according to the time and progress of the project. Although it cannot be calculated with a specific formula, generally the longer the project runs, the higher the cumulative value of indirect costs required (Soeharto, 1995).

Cost Engineering

Cost Engineering is one of the fields of engineering that includes the application of scientific and technical principles by using the experience and considerations of engineers in problems of cost estimation and engineering economics (Asiyanto, 2003). The role of Cost Engineering is to estimate the project business and control the realization of costs within the limits of the estimate. Cost engineering is divided into two major parts, namely cost estimation and cost control.

Cost Estimate

Estimation is essentially an attempt to assess or estimate value through analysis of calculations based on experience. If it is aimed at estimating construction costs, estimation is essentially an effort to apply engineering concepts based on auctions, field conditions, and contractor resources (Dipohusodo, 1996). There is an estimate for the physical banguana, namely the onewer version which is often called the Owner Estimate (OE) and the contractor version which is referred to as the Bid Price, (Aryanto, 2003). For the owner, the value of the activity / project contract is a cost to be paid, while for the contractor the value of the project contract is the revenue to be received.

Cost Control

Is one of the important aspects of management where there are costs that may have to be controlled to a minimum. Cost control must pay attention to the time factor, because there is a close relationship between time and project costs related to project completion time.

Conceptual Framework

The implementation of a building construction project is carried out through a certain project management system. The success rate of a project can be seen from the amount of cost efficiency, short time and product quality targets achieved. In a broad context, construction management functions to ensure the implementation of projects (construction) properly to achieve project success goals, namely timeliness, cost and quality. Since these performance targets are the result of an estimate, it must be recognized that the conformity between these performance targets and the actual results achieved cannot be guaranteed to be precise.

Therefore, to achieve a project goal, proper planning must be carried out, especially in determining the cost of human resources for construction projects. In determining the amount of human resource usage, it will be determined by several factors, including the type of project, project value, duration, technology, and so on. Each of these aspects will be analyzed in depth through literature studies, questionnaires, and interviews.

The expected goal is to obtain a project resource proportion model based on the conditions of the project so that it can be used as a reference in determining project financing, so that the accuracy of the proportion of human resource costs is achieved and cost waste can be avoided. Systematically the conceptual framework will be explained in Figure 1 as follows.

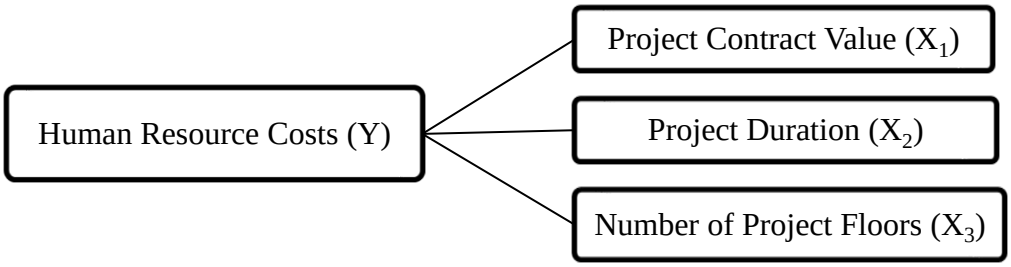

Figure 1 Conceptual Framework

Based on Figure 1, it shows the influence between the financing of the building construction project which consists of contract value, project duration, number of floors on the human resources of the Building Construction Project within the Office of Agenci Dejenvolvementu Nacional in Dili Regency. These three variables have a positive effect or in other words the higher the Contract Value ($X_{1)}$, Project Duration ($X_{2)}$, and the number of floors (X_3), the higher the human resource costs of building construction projects. Likewise, if the contract value ($X_{1)}$, Project Duration ($X_{2)}$, and the number of floors (X_3), have a negative effect or in other words the lower the human resource costs of development projects within the Dili district government.

Multiple Linear Regression

In this study, the data analysis used was multiple linear regression analysis. Multiple Linear Regression Analysis to determine the effect of independent variables (X) dependent variables (Y) using the Winarno formula (1999; 63).

$$\mathbf{Y_{.1} = a + b_1X_1 + b_2X_2 + b_3X_{(3)} + e \ldots (1)}$$
$$\mathbf{Y_{.2} = a + b_1X_1 + b_2X_2 + b_3X_{(3)} + e \ldots (2)}$$
$$\mathbf{Y_{.3} = a + b_1X_1 + b_2X_2 + b_3X_{(}3) + e \ldots (3)}$$

Where:

Y_1	= Expert Cost	a	= Constant/Intercept
Y_2	= Skilled Labor Cost	X_1	= Contract Value
Y_3	= Labor/Manor/Laden Cost	X_2	= Project duration
		X_3	= Number of Floors
b_1 and $b_{(2}$ of variables X_1 and X_2	= Regression coefficients	e	= *Error*

Correlation Coefficient (R)

Correlation analysis to determine several strong relationships between the independent variable and the dependent variable together. The formula used in correlation analysis is as follows:

$$r = \frac{n \sum Xi\, Yi - (\sum Xi)(\sum Yi)}{\sqrt{\{n\sum Y_i^2 - (\sum Xi)^2\}\{n\sum Y_i^2 - (\sum Yi)^2\}}}$$ (Sugiyono, 2005: 210)

Where:

r = Correlation Coefficient
X_1 = Contract Value
X_2 = Project Duration
X_3 = Number of Floors
Y_1 = Expert Cost
Y_2 = Skilled Labor Cost
Y_3 = Labor/Manor/Laden Cost

The R value varies between -1 and 1 (-1 ≤R ≤1), meaning that if R = -1 close to -

1, it shows that the relationship between the number of independent variables (X) together with the dependent variable (Y) is perfectly negative or in the opposite direction. If R = 0 or close to 0, it shows that there is no relationship between a number of independent variables (X) together with the dependent variable (Y). If R = 1 or close to 1, then the relationship between the independent variable (X) and the dependent variable (Y) is perfect and unidirectional or positive.

Coefficient of Determination (R^2)

To measure the effect of independent variables together on the dependent variable, namely by looking at the coefficient of determination with the formula:

$R^2 = \frac{Sum\ of\ Regreession}{Sum\ Square\ Total}$; (Sugiyono, 2003: 190)

The coefficient of determination (R^2), to measure how much the variables of motivation and project duration are able to explain the cost of human resources consisting of experts ($Y_{1)}$), skilled workers ($Y_{2)}$ and workers / mentors / laden ($Y_{3)}$), remains if $R_{(2)}= 0$, then the contract value, project duration and number of floors are not able to explain the cost of human resources consisting of experts ($Y_{1)}$), skilled workers ($Y_{2)}$), and workers / mentors / laden ($Y_{(3)}$).

Hypothesis Test

Hypothesis testing is a statistical method used to make inferences about a population based on a sample of data. It involves several main steps:

1. Formulate a null hypothesis (H0) and an alternative hypothesis (H1)
2. Determine the significance level (α)
3. Choosing the appropriate statistical test
4. Collect data and calculate test statistics
5. Comparing the results with the critical value or p-value
6. Make a decision to reject or fail to reject the null hypothesis

Hypothesis testing in this study consists of 2, namely, simultaneous tests and partial tests.

1. Simultaneous Test (F Test)

According to Sugiyono (2005:190), the F test analysis is used to determine how much the significant level of the relationship of all independent variables (contract value (X_1) Project Duration ($X_{2)}$, and the number of floors (X_3) together on the dependent variable Expert labor ($Y_{(1)}$), Skilled Labor ($Y_{2)}$ and Workers/Mandors/Laden ($Y_{(3)}$) by using the F test formula, namely:

$F_{count}= \frac{R^2\ /\ (k-1)}{(1-R^2)/(n-k)}$ (Sugiyono (2005:190))

Where:

R^2 = Coefficient of determination
k = Number of independent variables
n = Number of Samples

Hypothesis:

- Ho: $\beta_1 = \beta_2 = \beta_3 = 0$, means that the contract value (X_1) Project Duration (X_{2}) and the number of floors ($X_{(3}$)) simultaneously or together have no significant effect on the dependent variable (Expert Labor (Y_{1}), Skilled Labor ($Y_{2)}$, and Workers/Mandors/Laden ($Y_{(3))}$).
- $H_1 : \beta_{(1)} \neq \beta_{(2)} \neq \beta_{(3)} \neq 0$, meaning that the Contract value ($X_{(1}$)), Project Duration ($X_{2)}$, and amount (X_3) simultaneously or together do not have a significant effect on the dependent variable (Expert Labor ($Y_{1)}$), Skilled Labor ($Y_{2)}$, and

Workers/Mandors/Laden ($Y_{(3)}$).

Released *level of significance*: a = 0.05 (5%)

Critical Value by determining: a df = (n-k-1)

The test criterion used in F_{Count} is :

1. Hi is accepted if $F_{Count} \geq F_{Table}$ then the contract value (X_1), Project Duration (X_2), and Number of floors and (X_3) together have a significant influence on the dependent variable (Expert Labor (Y_1), Skilled Labor (Y_2), and Workers/Mandors/Laden labor ($Y_{(3)}$).
2. Ho is accepted if $F_{Count} < F_{Table}$ then the contract value (X_1), Project Duration (X_2), and the number of floors and (X_3) together do not have a significant influence on the dependent variable (Expert Labor (Y_1), Skilled Labor (Y_2), and Workers/Mandors/Laden (Y_3))

Partial Test (t test)

According to Sugiyono, (2005: 177), the t test is used to determine whether the independent variables (X_1 and X_2) individually on the dependent variable (Y) have a significant influence, the t formula is used:

$$t = \frac{b_i}{SE\ (b_i)}$$ (Algifari (2000: 19))

Where:

t : is the magnitude of the $t_{calculated}$ value

b_i : is the regression coefficient of the ith independent variable

SE (b_i) : is the standard error of the coefficient bi

Hypothesis:

- Ho: $\beta_1 = \beta_2 = \beta_3 = 0$, means that the contract value (X_1) Project Duration (X_2) and the number of floors ($X_{(3)}$) Individually or together have no significant effect on the dependent variable (Expert Labor (Y_1), Skilled Labor (Y_2), and Workers/Mandors/Laden ($Y_{(3)}$).
- H_1: $\beta_{(1)} \neq 0$ or $\beta_{(2)} \neq 0$ or $\beta_{(3)} \neq 0$, means that the Contract value (X_1), Project Duration (X_2), and amount (X_3) individually or each has a significant effect on the dependent variable (Expert Labor (Y_1), Skilled Labor (Y_2), and Labor/Mandor/Laden ($Y_{(3)}$).

Determining the criteria for rejecting and accepting the hypothesis of a certain value, namely finding the t value $_{table}$ with a significance level of 0.05 where the critical value of t ½ α = 0.025 with a degree of freedom of n-k-1.

The criteria are:

1. H_0 is accepted if $-t_{table} \leq t_{calculated} \leq t_{table}$, then the contract value (X_1), project duration (X_2), and number of floors (X_3) individually or individually do not have a significant effect on the dependent variable (Tenaga Ahlu (Y_1), Tenaga Keterampilan (Y_2), and Tenaga Pekerja/Mandor/Laden ($Y_{(3)}$).
2. H_0 is rejected if $t_{(count)} < t_{(table)}$ or $t_{count} > -t_{table}$ then the contract value (X_1), Project Duration (X_2), and Number of floors (X_3) then individually or each has no significant effect on the dependent variable (Expert Labor (Y_1), Skilled Labor (Y_2), and Workers/Mandors/Laden ($Y_{(3)}$).

Research Methods

In this research, the method used is using literature studies and field research. Literature studies are needed to know and understand the Theory of Constraint (TOC) or what is called the theory of constraints. As for field research conducted by distributing

questionnaires to contractor companies that have / are currently handling projects at the Dili City Government office. The questionnaire used is a phased questionnaire which is divided into two stages, namely the first questionnaire about the constraints faced in construction projects and the second (advanced) questionnaire is about the steps to resolve existing constraints.

The next steps section for research analyzing the factors causing human resource costs in construction projects within the Dili District Government Office will be carried out with a survey approach by sampling existing contract data according to the type of work.

Results and Discussions

The following are the results of research on the effect of building construction project financing consisting of contract value, project duration, number of floors on human resource costs consisting of 3 components, namely experts, skilled workers, and workers / mentors / laden on Building Construction projects in the Agenci Dejenvolvementu Nacional (ADN) Government Office environment in Dili City, Timor Leste.

Effect of Construction Project Financing on Expert Costs

The results of the hypothesis testing of the effect of financing building construction projects consisting of contract value, project duration, number of floors which are thought to have a persial effect on the cost of expert labor for the construction of the Agenci Dejenvolvementu Nacional (Adn) Office in Dili City, Timor Leste, can be seen in the table below.

Table 1 Calculation Results of t Test

Model	t_{count}	Sig.
Contract Value (X1)	6,082	0,000
Duration (X2)	9,567	0,000
Number of Floors (X3)	4,081	0,001

1. The t test of the Contract Value variable (X_1) on the Expert Cost variable (Y_1)
   - Hypothesis Test
     $H_0 : \beta_1 = 0$ (The Contract Value variable (X_1) has no significant effect on the Expert Cost variable)
     $H_0 : \beta_1 \neq 0$ (The Contract Value variable (X_1) has a significant effect on the Expert Cost variable)
   - Test Statistic: $t = 6.082$ and $\alpha = 0.000$
   - Conclusion
     Based on the calculation obtained t_{count} of 6.082 with a significant 0.000, H_0 is rejected because the significant value is less than 0.05 so it can be concluded that partially the Contract Value variable (X_1) has a significant effect on Expert Costs.
2. T test of Project Duration variable (X_2) on Expert Cost variable (Y_1)
   - Hypothesis Test
     H_0: $\beta_1 = 0$ (Project Duration variable (X_2) has no significant influence on the variable of Expert Cost)
     H_a: $\beta_1 \neq 0$ (The variable Project Duration (X_2) has a significant influence on the variable Expert Cost)

- Test Statistic: t = 9.567 and α = 0.000
- Conclusion
  Based on the calculation obtained t_{count} of 9.567 with a significant 0.000, H_0 is rejected because the significant value is smaller than 0.05 so it can be concluded that partially the Project Duration variable (X_2) has a significant effect on Expert Costs.

3. T test of variable Number of Floors (X_3) on variable Expert Cost (Y_1)
   - Hypothesis Test
     H_0: $\beta_1 = 0$ (Variable Number of Floors (X_3) does not have a significant influence on the variable Expert Cost)
     H_a: $\beta_1 \neq 0$ (The variable number of floors (X_3) has a significant effect on the variable cost of experts)
   - Test Statistic: t = 4.081 and α = 0.001
   - Conclusion
     Based on the calculation obtained t_{count} of 4.081 with a significant 0.001, H_0 is rejected because the significant value is smaller than 0.05 so it can be concluded that partially the variable Number of Floors (X_3) has a significant effect on Expert Costs.

Effect of Construction Project Financing on Skilled Labor Costs

The results of the hypothesis testing of the effect of financing building construction projects consisting of contract value, project duration, number of floors that are suspected to have a persial effect on the cost of skilled labor on Building Construction projects in the Agenci Dejenvolvementu Nacional (ADN) Government Office environment in Dili City, Timor Leste, can be seen in table 2 below.

Table 2 Calculation Results of t Test

Model	t_{count}	Sig.
Contract Value (X1)	5,467	0,000
Duration (X2)	8,850	0,000
Number of Floors (X3)	4,256	0,001

1. The t-test of the Contract Value variable (X_1) on the Skilled Labor Cost variable (Y_2)
   - Hypothesis Test
     H_0 : $\beta_1 = 0$ (The Contract Value variable (X_1) has no significant effect on the Skilled Labor Cost variable)
     H_a : $\beta_1 \neq 0$ (Contract Value variable (X_1) has a significant influence on Skilled Labor Cost variable)
   - Test Statistic: t = 3.956 and α = 0.001
   - Conclusion
     Based on the calculation obtained t_{count} of 5.467 with a significant 0.000, H_0 is rejected because the significant value is smaller than 0.05 so it can be concluded that partially the Contract Value variable (X_1) has a significant effect on Skilled Labor Costs.

2. T-test of Project Duration variable (X_2) on Skilled Labor Cost variable (Y_2)
   - Hypothesis Test
     H_0 : $\beta_1 = 0$ (Project Duration variable (X_2) has no significant influence on Skilled Labor Cost variable)
     H_a : $\beta_1 \neq 0$ (Project Duration variable (X_2) has a significant influence on Skilled Labor Cost variable)
   - Test Statistic: t = -0.715 and $\alpha = 0.485$
   - Conclusion
     Based on the calculation obtained t count of 8.850 with a significant 0.000, H 0 is rejected because the significant value is smaller than 0.05 so it can be concluded that partially the Project Duration variable (X 2) has a significant effect on the Cost of Skilled Labor.
3. T-test of variable Number of Floors (X_3) on variable Skilled Labor Cost (Y_2)
   - Hypothesis Test
     H_0 : $\beta_1 = 0$ (Variable Number of Floors (X_3) has no significant influence on the variable Skilled Labor Cost)
     H_a : $\beta_1 \neq 0$ (Variable Number of Floors (X_3) has a significant influence on the variable Skilled Labor Cost)
   - Test Statistic: t = 4.256 and $\alpha = 0.001$
   - Conclusion
     Based on the calculation obtained t_{count} of 4.256 with a significant 0.001, H_0 is rejected because the significant value is smaller than 0.05 so it can be concluded that partially the variable Number of Floors (X_3) has a significant effect on the Cost of Skilled Labor.

Effect of Construction Project Financing on Labor Costs of Workers/Mandors/Laden

The results of the hypothesis testing of the effect of financing building construction projects consisting of contract value, project duration, number of floors which are thought to have a persial effect on Workers / Mendor / Laden on Building Construction projects in the Agenci Dejenvolvementu Nacional (ADN) Government Office environment in Dili City, Timor Leste can be seen in table 3 below.

Table 3 Calculation Results of t test

Model	t_{count}	Sig.
Contract Value (X1)	2,515	0,023
Duration (X2)	19,227	0,000
Number of Floors (X3)	0,094	0,047

1. The t-test of the variable Contract Value (X_1) on the variable Labor Cost of Workers/Mandors/Laden (Y_3)
   Hypothesis:
   - Hypothesis Test
     H_0 : $\beta_1 = 0$ (The Contract Value variable (X_1) has no significant effect on the Worker/Mandor/Laden Cost variable)

H_a : $\beta_1 \neq 0$ (The variable Contract Value (X_1) has a significant influence on the variable Labor Cost of Workers/Mandors/Laden)

- Test Statistics: t = 2.515 and α = 0.023
- Conclusion
  Based on the calculation obtained t_{count} of 2.515 with a significant 0.023, H_0 is rejected because the significant value is smaller than 0.05 so it can be concluded that partially the Contract Value variable (X_1) has a significant effect on Labor Costs of Workers / Mendor / Laden.

2. The t-test of the Project Duration variable (X_2) on the Labor Cost/Mandor/Laden variable (Y_3)
   - Hypothesis Test
     H_0 : $\beta_1 = 0$ (Project Duration Variable (X_2) does not have a significant influence on the variable Labor Cost/Manor/Laden)
     H_a : $\beta_1 \neq 0$ (The variable Project Duration (X_2) has a significant influence on the variable Labor Cost/Manor/Laden)
   - Test Statistic: t = 19.227 and α = 0.000
   - Conclusion
     Based on the calculation obtained t_{count} of 19.227 with a significant 0.000, H_0 is rejected because the significant value is smaller than 0.05 so it can be concluded that partially the Project Duration variable (X_2) has a significant influence on the Labor Cost of Workers/Mandors/Laden.
3. The t-test of the variable Number of Floors (X_3) on the variable Labor Costs/Manor/Laden (Y_3)
   - Hypothesis Test
     H_0 : $\beta_1 = 0$ (Variable Number of Floors (X_3) does not have a significant influence on the variable Labor Cost of Workers/Mandors/Laden)
     H_a : $\beta_1 \neq 0$ (Variable Number of Floors (X_3) has a significant influence on the variable Labor Cost of Workers/Mandors/Laden)
   - Test Statistics: t = 2.157 and α = 0.047
   - Conclusion

Based on the calculation obtained t_{count} of 2.157 with a significant 0.047, H_0 is rejected because the significant value is smaller than 0.05, so it can be concluded that partially the variable Number of Floors (X_3) has a significant effect on Labor Costs of Workers/Mandors/Laden.

Conclusion

Based on the analysis and discussion above, the following conclusions can be drawn: the effect of financing of building construction projects, consisting of contract value, project duration, and number of floors, has a partial effect on human resources in the Agenci Dejenvolvementu Nacional Office Building construction project in Dili City. The results of the t-test (partial) show that the contract value variable has a partial effect on human resource costs (Costs of Experts, Skilled Workers, and Costs of Workers/Mandor/Laden) on building construction projects within the Dili City Government Office. Thus, the second hypothesis, which states "There is an effect of building construction project financing on the value of the contract, individually on Human Resources on one variable," is accepted, and two variables are rejected, which will be explained as follows: a) Experts (Y1): only one contract value variable (X1) has

a partial effect, and two variables—project duration (X2) and number of floors (X3)—do not have a partial effect; b) Skilled Labor (Y2): only one contract value variable (X1) has a partial effect, and the two variables—project duration (X2) and number of floors (X3)—do not have a partial effect; c) Labor/Mandor/Laden (Y3): only one variable of contract value (X1) has a partial effect, and the two variables—project duration (X2) and number of floors (X3)—do not have a partial effect.

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