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Analysis of Factors that Influence Flat Construction Work

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ABSTRACT

This research aims to analyze the factors that influence the success of building flats in Jambi Province. The sample for this research was staff and employees involved in the construction of flats, totaling 105 people. The method used is a quantitative method with the SEM-Smart-PLS analysis technique. The data used is primary and secondary data, hypothesis testing uses weight relations. The results of research regarding factors that influence construction work, namely financing, do not have a significant influence on the structure of building work. Labor does not have a significant influence on the structure of building work. Equipment has a positive and significant influence on the structure of building work. Materials have a positive and significant influence on the structure of building work. Financing, labor, equipment and materials have a positive and significant influence on the structure of building work.

INTRODUCTION

The government is facing increasing challenges to provide adequate housing for its citizens due to the increasing population in urban areas. The dwindling availability of land makes the concept of vertical housing one of the solutions that is considered the most appropriate (Hiban et al., 2020) . One of these solutions, apart from apartments, is the construction of flats or flats (Maulana et al., 2020) . Building flats has several advantages, such as reducing land use, creating more open space in the city, and being a way to rejuvenate the city, especially in slum areas (Sompa et al., 2021) . The general aim of building flats is to meet the needs of adequate housing for the community, especially those with middle to lower incomes (Maulana et al., 2020) . Apart from that, the construction of flats aims to increase the usability and yield of land in urban areas by paying attention to the preservation of natural resources, as well as creating a complete, harmonious and balanced residential environment.

However, even though the construction of flats continues, there are still many challenges faced in terms of development quality, affordability and effectiveness of land use. Without the right approach, apartment construction could end up not being optimal, and even fail to achieve the expected social and economic goals. This creates an urgent need for in-depth research to identify the critical factors that influence the success of flat projects, to ensure that these projects can provide maximum benefits to society and contribute positively to urban governance.

According to Law no. 20 of 2011, flats can be divided into several types, namely General Flats, Special Flats, State Flats and Commercial Flats. Public Flats are organized to meet the housing needs of low-income people, where ownership can be done by owning or renting. Special Flats are intended to meet special needs, where control can be done by borrowing or renting. State Flats are flats that are owned by the state and function as a residence or residence, a means of family development, and to support the implementation of

the duties of officials and/or civil servants. Control can be done by borrowing, renting or rent-purchasing. Meanwhile, commercial flats are held for profit, where control can be done by owning or renting.

In terms of ownership, flats are divided into several categories, namely flats for sale (Rusunami), flats for rent (Rusunawa), buy-sell flats, rent-buy flats, and small buy flats. Each of these categories has different ownership or rental mechanisms, depending on development goals and market targets.

Apart from that, flats have several differences from apartments. Apartments are vertical residences that offer more luxury and comfort for their residents, with various facilities such as swimming pools, fitness centers and minimarkets. Even though flats and apartments are both vertical residences, there are significant differences between the two in terms of price, target market, facilities, location, unit type and area, security, level of privacy and monthly fees. Apartments are usually aimed at the upper middle class with more complete facilities and higher privacy, while flats are simpler and aimed at the lower middle class.

In terms of construction, apartments are generally built with more complex structures and rise up to tens of floors, while flats usually only consist of a few floors without cement and have simpler construction. The technical requirements for building flats are also stricter than for ordinary housing, as regulated in the Minister of Public Works Regulation Number 05/PRT/M/2007 concerning Technical Guidelines for the Construction of Simple High-Rise Flats.

The construction of flats is also regulated in Government Regulation Number 13 of 2021 concerning the Implementation of Flats, which regulates various aspects such as the type and use of flats, the use of waqf land for public flats, as well as the control of the management of flats.

In general, the construction of flats has the same parameters as other projects, namely cost, quality and time. These three parameters are closely related and become benchmarks for project success.

However, the construction of flats also has special limitations, such as being aimed at the lower middle class, the existence of technical guidelines from the government, and the need to achieve predetermined cost, quality and time parameters.

These limitations give unique and different characteristics to the construction of flats compared to other buildings. Unfortunately, previous studies on apartment building tend to focus on technical aspects, such as architectural design and construction technology. In-depth research on non-

Therefore, it is important to analyze the factors that influence the success of flat construction. This research offers a new approach by combining technical and non-technical analysis in evaluating the factors that influence the success of apartment construction. By integrating cost, quality and time parameters with project management factors and government policies, this research is expected to provide more holistic and practical insight for stakeholders in planning and implementing apartment projects. This research will also utilize a more comprehensive analysis method and based on empirical data to identify and prioritize critical factors that have not been widely researched before, so that it can offer more effective and applicable solutions in the context of urbanization in Indonesia. Thus, this research aims to explore what factors influence the success of flat construction and determine which factors have the greatest influence.

METHODS

Questionnaire and Respondents

The respondents who will be the target of distributing the questionnaire are staff and

technical factors such as project management, community participation, and government regulations is still limited. Apart from that, comprehensive empirical studies regarding how the three main parameters (cost, quality and time) influence each other in the context of building flats for the lower middle class are also rarely found. This limitation shows that there is a significant knowledge gap regarding the factors that truly determine the success or failure of an apartment building project.

The research method is quantitative research using scientific techniques to collect data or information to solve problems and reach conclusions. Valid data is data that is correct and accurate, while reliable data is data that is consistent and trustworthy. These two types of data are defined as research methods used to obtain data. This research conducted research using quantitative methods, which used a lot of numerical data. This numerical data is then processed statistically and analyzed to reach conclusions.

Research Object

The research location was carried out at the Flats Construction Project built by the Housing Provision Implementation Agency (BP2P) Sumatra IV which is located in Jambi Province, namely the Jambi High Court Flats Construction Project, the Raden Mattaheer Hospital Jambi Flats Construction Project, the PUPR Aur Flats Construction Project Duri and the Muhammadiyah Bagan Peta Flats construction project in Jambi City.



Figure 1. Map of Jambi City

employees involved in the construction of the flat, whether directly involved or not. Respondents who have been involved in multi-storey building

construction projects for at least two years were asked to fill out a questionnaire. The goal is to get accurate and responsible answers. This questionnaire was carried out via online media by clicking on the link sent via WA message. Apart from that, it can also be done offline, namely by visiting and asking respondents to fill out a questionnaire at their workplace.

Data Analysis Techniques

This research uses the Structural Equation Model Partial Least Square (SEM-PLS) data analysis method with SMART PLS software, because this method is more suitable for predicting and explaining latent variables with a small sample size (AM et al., 2022). In this analysis, there are two main models analyzed: the Measurement Model (Outer Model) and the Structural Model (Inner Model) (Salloum et al., 2019). In the Measurement Model, validity and reliability are tested through convergent validity, discriminant validity and composite reliability (Wahyudi et al., 2022). Convergent validity is measured by standard loading factors and AVE, where the minimum AVE value used is 0.50 (AM et al., 2023; Am & Setiawati, 2023). Discriminant validity was tested

through correlation between latent variables, and composite reliability was assessed as better than Cronbach's Alpha in measuring internal consistency (Dam & Dam, 2021). In the Structural Model, the relationship between latent variables is analyzed through path coefficients, R², effect size (f²), and predictive relevance (Q²) (Reis et al., 2011). The R² value measures how much the independent variable can explain the dependent variable, while the f² value assesses the influence of exogenous variables on the dependent variable. In addition, the Goodness of Fit (GoF) test is used to evaluate the overall model with the recommended GoF value of 0.50 or more (Jr. et al., 2017; Mirza et al., 2022).

RESULTS AND DISCUSSION

Outer model

Outer model analysis was carried out to describe the relationship between the indicator blocks and the latent variables. In the outer model, there are 3 measurement criteria for measuring the outer model, namely convergent validity, discriminant validity and composite reliability (Rubio et al., 2007).

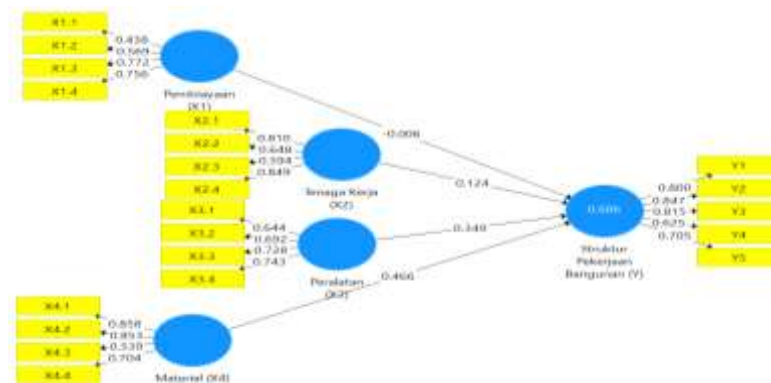


Figure 2. Outer Model Before Outliers

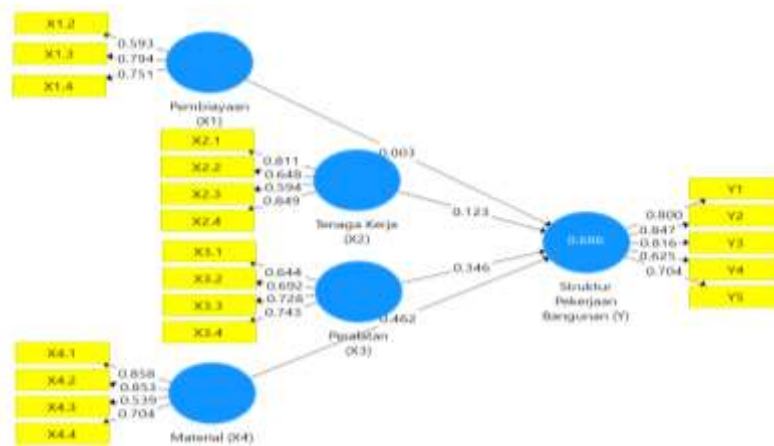


Figure 3. Outer Model After Outliers

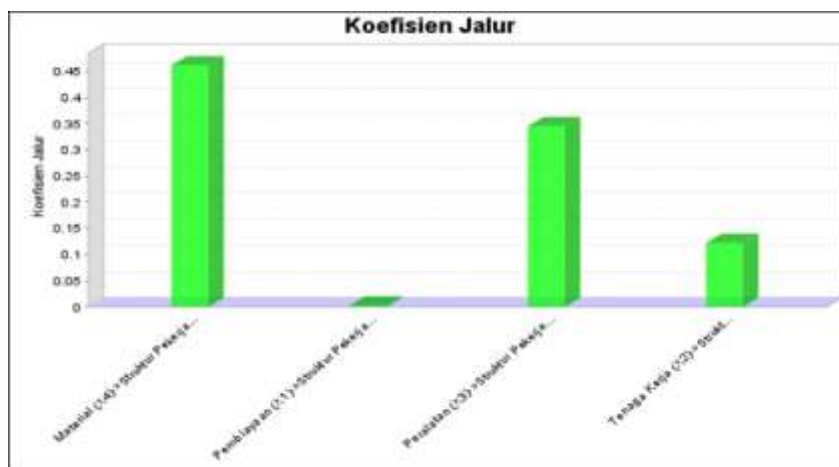


Figure 4. Path Diagram

Convergent Validity Test

The results of the convergent validity analysis, where we pay attention to the loading factors for each variable related to financing, labor, equipment, materials and structure of building work (Jr. et al., 2017) . The criteria used are that the loading factor must exceed 0.50 to assess the contribution of each variable in forming relevant factors (Thees et al., 2021) . The results of the analysis above show that most of the items observed have factor loadings that exceed the predetermined criteria, and show the accuracy of variable measurements in building relevant factors. The variables X1.3 and X1.3 which are related to the financing variable show a high loading factor with values of 0.794 and 0.751.

Likewise, variables X2.1 and X2.4 which are related to the labor variable also show significant values of 0.811 and 0.849. For variables X3.2 and X3.4 which are related to the equipment variable,

they also show a significant loading factor of 0.728 and 0.743. And for variables 4X4.1, X4.2 and It can be concluded that these results identify the consistency and reliability of the measurements used in assessing the variables in the study. Thus, the results of this convergent validity analysis provide confidence regarding the quality of measuring the variables used in this research, and confirm that these variables reflect good building work.

Discriminant Validity

Discriminant validity is used to test whether the indicators of a construct are not highly correlated with indicators of other constructs (Wahyudi et al., 2022) . The results of the discriminant validity analysis, where we have to pay attention to the heterotrait ratio (htmt) value for each pair of variables (Kurniati et al., 2022) . The criteria used are that the htmt value must be smaller

than 0.90 to confirm that the constructs measured by the instrument are unique and different from one another (Nunkoo et al., 2020). The results of the analysis in the table above show that all pairs of variables observed meet the discriminant validity criteria with an htmt value of less than 0.90, indicating that the constructs measured by the instrument are unique and different from each other. For example, the pair of financing variables with the building work structure variable has an htmt value of 0.663, which is below the specified criteria, and likewise for the other variables, all of which meet the discriminant validity criteria. This shows that the measurement instrument used is capable of distinguishing between different constructs in the analysis. Thus, the results of this discriminant validity analysis provide confidence that the variables observed are unique and different, and there is no overlap between the constructs measured by the instrument.

Reliability Estimate

Reliability estimate is used to evaluate how consistent and reliable a measurement instrument is (Abed et al., 2022). Results from analysis of reliability tests for observed variables, including financing, labor, equipment, materials, and building work structure. In this analysis, we pay attention to Cronbach's, rho_A, composite reliability and AVE values to assess the reliability of the instruments used (Shakil & Majeed, 2018). The criteria used are that the AVE value must be greater than 0.50, while the Cronbach's Alpha and composite reliability (rho_c) values must be greater than 0.70 to indicate an adequate level of reliability (Fariani et al., 2021; Hien et al., 2020). The results of the analysis above show that of all the observed variables there are variables that do not meet the predetermined reliability criteria. For example, the financing variable has a Cronbach's alpha value of 0.536, rho_A of 0.564, while the Cronbach's Alpha and composite reliability (rho_c) values must be greater than 0.70. This means that in terms of financing variables, the level of reliability is not sufficient. For the composite reliability of the financing variable, it has a value of 0.759, meaning

that the composite reliability of the financing variable has met the criteria. For the equipment variable, it has a Cronbach's alpha value of 0.658, rho_A of 0.660 and an AVE value of 0.494. This means that the equipment variable is still acceptable with the criteria that have been set. Meanwhile, the material, labor and building work structure variables show good reliability, with all values following the specified criteria. This confirms that the measurement instrument used in this research is reliable in measuring the observed variables. Thus, the results of this reliability estimate analysis provide confidence in the reliability of the measurement instrument and the validity of the variable constructs used in this research.

Inner Model

Multicollinearity Test

The multicollinearity test is used to evaluate how strong the relationship is between the independent variables in the regression model. Collinearity statistics (VIF) for each independent variable, which measures how much of the variance of that independent variable can be explained by other independent variables in the model (Watson, 2017). In this analysis, the criterion used is that the VIF value must be less than 10 to determine that there is no significant multicollinearity problem in the regression model. From the results of the analysis above, it can be seen that overall there is no multicollinearity in the indicators because the VIF value is <10 (Purwanto & Sudargini, 2021). So it can be concluded that the results of this multicollinearity test mean that the regression model can be relied on in analyzing the relationship between the variables in this research.

Coefficient of Determination

The coefficient of determination is an important metric in evaluating how well a regression model fits the observed data. Coefficient of determination (R Square) and Adjusted R Square for the building work structure variable (Mappesona et al., 2020). The criteria used to assess the strength of the model are that the R Square value must be between 0.25 to 0.50 to indicate a moderate model, and a value above 0.50 indicates a strong model

(Hasibuan & Wahyuni, 2020) . The results of the analysis above show that the coefficient of determination (R Square) for the building work structure variable is 0.686 while the Adjusted R Square is 0.673. This shows that the model built is able to explain around 68.6% of the variability in building work structure variables. With this value, it can be said that this model has a strong model in explaining variability in the structure of building work. Thus, because the Adjusted R Square value is more conservative and takes into account the number of variables in the model, the value of 0.673 indicates that the model maintains excellent power even after accounting for model complexity. It can be concluded that the results of this analysis provide confidence that the regression model used is able to very well explain variations in building work structure variables.

Effect Size

It is important to understand the concept of effect size which is used to evaluate how big the impact or influence of the independent variable is on the dependent variable in the regression model. F Square value for employee performance variables resulting from analysis. The criteria used to assess effect size are that an F Square value of 0.02 indicates a small or low impact, a value of 0.15

indicates a medium or medium impact, and a value of 0.35 indicates a large or strong impact (Hair et al., 2017) . The results of the analysis above show that the material variable has an F Square value of 0.245, which shows that this variable has a medium or moderate impact on the structure of building work. The financing variable has an F Square value of 0.000, indicating a lower but still significant impact on the structure of building work. The equipment variable has an F Square value of 0.142, which shows a moderate impact on the structure of building work. The labor variable has an F Square value of 0.031, indicating a moderate impact on the structure of building work. From the results of this analysis, to improve the structure of building work, it is necessary to pay attention to materials, financing, equipment and labor.

Proving Hypothesis

Table 1 presents the path coefficient values for each hypothesis tested, including financing, labor, equipment, materials and building work structure. The criteria used to determine the significance of the direct effect are that a p-value of less than 0.05 indicates a significant effect, while a p-value of greater than 0.05 indicates an insignificant effect.

Table 1. Path Coefficient

Hypothesis	Q	Sig	Information
Material (X4) -> Building Work Structure (Y)	5,457	0,000	Significant
Financing (X1) -> Building Work Structure (Y)	0.031	0.975	Not Significant
Equipment (X3) -> Building Work Structure (Y)	3,381	0.001	Significant
Labor (X2) -> Building Work Structure (Y)	1,727	0.085	Not Significant
Financing (X1) -> Labor-> equipment (X3)->Material (X4) -> Building Work Structure (Y)	3,300	0.001	Significant

The results of the analysis show that Materia has a significant influence on the structure of building work, with a t-statistics value of 5.457 and a P value of 0.000. The financing variable does not have a significant influence on the structure of building work with a t-statistics value of 0.031 and

a P value of 0.975. The equipment variable has a significant influence on the structure of building work with a t-statistics value of 0.381 and a P value of 0.001. The labor variable does not have a significant influence on the structure of building work with a t-statistics value of 1.727 and a P value

of 0.085. and for indirect relationships on financing, labor, equipment, materials have a significant effect on the structure of building work with t-statistics of 3.300 and P Value of 0.001.

Discussion

The Influence of Financing on Building Work Structure

Based on the results of the analysis carried out by researchers regarding hypothesis 1 regarding the influence of financing on the structure of building work, it can be explained that financing does not have a significant influence on the structure of building work. The results show that the P value is > 0.05 , which can be seen from the t-statistics of 0.031 and the P value of 0.975 (hypothesis 1 is rejected). This identified that increased funding would not impact the structure of the building works. This means that funding is lacking for the structure of building work, therefore there is a need to increase funding for building work. Because financing is the main thing in developing a project, without financing, project development will not run smoothly.

The Influence of Labor on Building Work Structure

Based on the results of the analysis carried out by researchers regarding hypothesis 2 regarding the influence of labor on the structure of building work, it can be explained that the influence of labor does not have a significant influence on the structure of building work. These results show that the P value is >0.05 , it can be seen from the t-statistics value of 1.727 and the P value of 0.085, so hypothesis 2 is rejected. This identified that the increase in labor had no impact on the structure of building work. This means that there is less labor for the building work structure. Therefore, it is necessary to increase the workforce in project development. Without sufficient workforce, project development will not run well, just like financing, if there is a lack of project work, there will be obstacles in project work.

The Effect of Equipment on the Structure of Building Work

Based on the results of the analysis carried out by researchers regarding the third hypothesis regarding the influence of equipment on the structure of building work, it can be explained that equipment has a positive and significant influence on the structure of building work. These results show that the P value is <0.05 , which can be seen from the t-statistics value of 3.381 and the P value of 0.00, therefore hypothesis 3 is accepted (H3 is accepted). This means that improvements in equipment will contribute significantly to improving the structure of building work. The role of equipment is very influential on building work, because without equipment to build a project, a building cannot be built. Therefore, the more equipment there is, the better the building work structure will be and conversely, if there is less equipment, the increase in work structure will decrease.

The Influence of Materials on the Structure of Building Works

From the results of the analysis carried out by researchers regarding the hypothesis of the influence of materials on the structure of building work, it is explained that materials have a positive and significant influence on the structure of building work. The results show that the P value is <0.05 , which can be seen from the t-statistics value of 5.457 and the P value of 0.000. Hypothesis 4 is accepted (H4 is accepted). This means that improvements in materials contribute to the structure of the building work. The role of materials is very influential in improving the structure of building work. It can be concluded that materials in a construction project are very important, this proves that without them a building will not be created and materials that have good quality will provide a stronger and more durable building structure. The higher the quality of the material, the higher the quality of the building will be, and conversely, if the quality of the material is low, the quality of the building will decrease or will not last long.

Influence of Financing, Labor, Equipment, Materials on Building Work Structure

From the results of the analysis carried out by researchers regarding the hypothesis of the influence of financing, labor, equipment and materials on the structure of building work, it is explained that financing, labor, equipment and materials have a positive and significant influence on the structure of building work. The results show that the P value is <0.05 , which can be seen from the t-statistic value of 3.300 and the P value of 0.001. Hypothesis 5 is accepted (H5 is accepted). This means that increases in financing, labor, equipment and materials play a significant role in improving the structure of building work. This proves that the more financing, labor, equipment and materials increase, the better the building work structure will be (Lasmara, Freddie; and Rahayu, 2019) . Because without financing, labor, equipment and costs will not be able to carry out development projects because these four factors are important factors for development work.

CONCLUSION

This research uses primary and secondary data obtained directly from the research object, with data collection methods through questionnaires distributed to 105 respondents consisting of staff and employees involved in the construction of flats for the Jambi High Prosecutor's Office and the Jambi Regional Police Flats Construction Project. Based on the results of the outer model analysis, the observed variables meet the criteria for convergent and discriminant validity, and show adequate reliability, although there are several variables such as financing and equipment that have reliability that is not fully optimal. In the inner model analysis, the results of the multicollinearity test show that there are no significant multicollinearity problems, and the coefficient of determination (R Square) of 0.686 indicates that the model built has a strong ability to explain variability in the structure of building work. In addition, effect size analysis shows that material variables have a medium impact, while financing, equipment, and labor variables have varying impacts on the structure of building work.

Although this research provides an in-depth understanding of the factors that influence the structure of building work, there are several limitations that need to be considered. First, the reliability of the financing and equipment variables is not yet fully optimal, which can affect the accuracy of the research results. Second, this research only involved two development projects in Jambi, so the results may not be generalizable to development projects in other regions. Third, the quantitative approach used may not fully capture the complexity of interactions between observed variables.

For future research, it is recommended to increase the reliability of the measurement instruments, especially on financing and equipment variables, as well as expand the research scope by involving more development projects in various regions to increase the generalizability of the results. In addition, the use of a mixed-method approach can provide a more comprehensive understanding of the factors that influence the structure of building work. Further research could also consider other factors that have not been tested in this study, such as aspects of project management and regulatory policies that may play a significant role in influencing the structure of building work.

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