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# Analysis of Contractor Performance on User Satisfaction in Road and Bridge Construction Projects in North Morowali Regency

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**Abstract: This study analyzes the influence of contractor performance on user satisfaction in road and bridge construction projects in North Morowali Regency. Data collection used a questionnaire within the Public Works, Spatial Planning, Housing, and Regional Settlement Areas Office of North Morowali Regency. Data analysis employed two methods: Structural Equation Modeling based on Partial Least Squares (SEM-PLS) and Relative Importance Index (RII). The SEM-PLS analysis results show that contractor performance has a very strong contribution to user satisfaction, with an R-Square ($R^2$) value of 0.789. This indicates that 78.9% of user satisfaction is influenced by contractor performance. Based on the RII analysis, the Specifications and Material Testing Results indicator is the most dominant factor influencing contractor performance, with an RII value of 0.709. For user satisfaction, three main indicators have a balanced RII value (0.663): compliance with the work plan and budget; contractor understanding of owner needs; and proactive and solution-oriented capabilities when addressing field problems. Equipment suitability is the lowest contractor performance indicator, with an RII value of 0.589. Therefore, strategies to improve performance are needed, such as strict periodic maintenance, having spare parts available on-site, using officially licensed operators, and completing daily equipment check sheets.**

***Keywords:*** *Contractor Performance, User Satisfaction, Roads and Bridges, SEM-PLS, RII.*

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## I. INTRODUCTION

North Morowali Regency is one of the rapidly developing regions in Central Sulawesi Province. This area has abundant natural resource potential, especially in the mining sector, as well as being supported by potential in agriculture and fisheries. In recent years, North Morowali Regency has experienced significant economic growth driven by high investment rates. This increase in economic activity has direct implications for the soaring need for adequate infrastructure provision. Road and bridge infrastructure development is one of the main pillars in driving economic growth, smoothing logistics routes, and improving regional connectivity [1].

In realizing this infrastructure development, the role of construction service companies or contractors is crucial. Road and bridge construction projects are included in the heavy civil engineering category that demands high precision. Their implementation in the field is carried out by the winning tender contractor under the supervision of consultants and the Public Works (PU) Department. Every work stage must comply with working drawings, technical specifications, and the Work Plan and Requirements (RKS) contained in the contract documents [2]. Furthermore, the Government of the Republic of Indonesia through Government Regulation (PP) Number 14 of 2021 has also regulated the implementation of construction services to ensure that projects are carried out by competent experts, meet quality and safety standards, and are able to compete in the construction industry.

The Public Works Department of North Morowali Regency as the service user (project owner) continues to push road and bridge development. However, in practice in the field, there are still many challenges and obstacles faced. Project implementation is often colored by problems such as a lack of skilled labor, delays in project completion, and high occupational safety and health risks. Contractor performance in construction projects is the main determining factor for project success. Good performance will ensure the project is completed on time, within budget, and with high quality. Conversely, poor contractor performance can trigger negative deviations such as schedule delays, cost overruns, and low physical construction quality [3].

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The derivative impact of contractor performance quality culminates in the level of user satisfaction. The contractor's ability to meet contract specifications and resolve field problems will be directly proportional to the satisfaction of the PU Department as a representative of the regional government. Therefore, it is important not only to evaluate technical performance but also to measure the extent to which this performance affects user satisfaction. In addition, it is necessary to dissect more specifically what the dominant factors are, both from the internal management side of the contractor and from the user expectation side, that most determine success and satisfaction in these projects.

Previous studies relevant to this topic include Maulana [4] who analyzed customer satisfaction with project management performance in small-qualified building contractors in Yogyakarta with a CSI result of 78.105%. Fitriana [5] measured contractor satisfaction with client performance in private construction projects with a CSI value of 70.73%. Lyanawati [6] analyzed contractor performance on road improvement project quality in Probolinggo Regency using multiple regression. Kurnia [7] examined user satisfaction levels with contractor performance in a case study of office building maintenance at the West Java Regional Police with a CSI value of 73.10. Kurniawan [8] identified critical factors determining customer satisfaction with building contractor projects in Bukittinggi City. Syahroni & Siswoyo [2] analyzed owner satisfaction with contractor performance at the Public Works and Spatial Planning Department of Lumajang Regency with a CSI value of 66.32%.

Based on this background, the research problems are: (1) How does contractor performance influence user satisfaction in road and bridge construction projects in North Morowali Regency; (2) What dominant factors influence contractor performance in road and bridge construction projects in North Morowali Regency; (3) What dominant factors influence user satisfaction in road and bridge construction projects in North Morowali Regency; (4) How to improve contractor performance in road and bridge construction projects in North Morowali Regency.

## II. MATERIAL AND METHODS

➢ *Research Type*

This research is a descriptive quantitative study. Quantitative research with a descriptive format aims to explain, summarize various conditions, situations, or variables that arise in society as research objects based on what occurs [9]. In this study, the researcher explains the relationship between variables by describing the series of relationships between variables, testing hypotheses, and developing existing theories from previous research results.

➢ *Research Location and time*

This research was located in North Morowali Regency within the scope of work of the Public Works, Spatial Planning, Housing, and Regional Settlement Areas Office of North Morowali Regency. The samples used as research material were road and bridge projects in the 2024 fiscal year.

➢ *Population and Sample*

The population in this study was all employees of the Public Works, Spatial Planning, Housing, and Regional Settlement Areas Office (DPUPRPKPD) in the Highways division. The sampling technique used was saturated sampling, where all population members were used as samples [10]. The number of respondents in this study was 35 people consisting of 1 Budget User Authority (KPA), 3 Commitment Making Officials (PPK), 1 Technical Activity Implementation Official (PPTK), and 30 Department Supervisors.

➢ *Data Collection Techniques*

Data collection techniques in this study were divided into two parts: primary and secondary data collection. Primary data was collected through observation and questionnaires. The research instrument used was a questionnaire with a Likert scale interval value for each answer ranging from 1 to 5, with categories: Strongly Disagree (1), Disagree (2), Agree (3), Quite Agree (4), and Strongly Agree (5).

➢ *Research Questionnaire Design*

Table 1 Questionnaire Design for Contractor Performance Variables

| No. | Variable | Indicator | |
|---|---|---|---|
| 1 | Human Resource (Man) | Man 1 | Work discipline |
| | | Man 2 | Work motivation |
| | | Man 3 | Project administration |
| 2 | Finance (Money) | Mon 1 | Company finance |
| | | Mon 2 | Monthly work certificate |
| | | Mon 3 | Contractor financial management |
| 3 | Equipment (Machine) | Mac 1 | Equipment completeness |
| | | Mac 2 | Equipment condition |
| | | Mac 3 | Equipment management and operation |
| 4 | Material | Mat 1 | Material quality |
| | | Mat 2 | Material availability and supply |
| | | Mat 3 | Specifications and material testing results |

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| | | | |
|---|---|---|---|
| 5 | Methods | Met 1 | Work skills |
| | | Met 2 | Experience |
| | | Met 3 | Work methods |
| 6 | Work Environment | LK 1 | Physical work environment |
| | | LK 2 | Non-physical work environment |
| | | LK 3 | Occupational safety and health |

Source: Primary Data, 2026

Table 2 Questionnaire Design for User Satisfaction Variables

| No | Kode | Indicator |
|---|---|---|
| 1 | KPJ 1 | Conformity of work results with working drawings |
| 2 | KPJ 2 | Conformity of work results with budget plan |
| 3 | KPJ 3 | Conformity of work results with technical specifications |
| 4 | KPJ 4 | Conformity of work results with terms of reference |
| 5 | KPJ 5 | Minimal work defects |
| 6 | KPJ 6 | On-time/earlier project completion |
| 7 | KPJ 7 | Conformity of weekly/monthly work schedules |
| 8 | KPJ 8 | Adjustment to work environment |
| 9 | KPJ 9 | Rework |
| 10 | KPJ 10 | Working hours |
| 11 | KPJ 11 | Responsiveness and timeliness |
| 12 | KPJ 12 | Clarity and completeness of information |
| 13 | KPJ 13 | Understanding of user needs |
| 14 | KPJ 14 | Transparency and honesty |
| 15 | KPJ 15 | Proactive and solution-oriented capability |
| 16 | KPJ 16 | Quality of meetings and discussions |
| 17 | KPJ 17 | Work reporting |

Source: Primary Data, 2026

➢ *Analytical Methods*

The research methods used in this study consist of three main parts: descriptive statistical approach, Relative Importance Index (RII), and Structural Equation Modeling Partial Least Square (SEM-PLS).

Relative Importance Index (RII) is used to measure the dominant factors of contractor performance. The RII method allows for the identification of the importance level of these indicators [11]. Based on the RII results Indicator with higher RII values are deemed critical, whereas lower RII values indicate that the factor exerts a minor impact [12]. The RII calculation uses the following equation:

$$\text{RII} = \frac{\sum W}{AN}$$

Where: W = Weight (Range 1-5), A = Highest weight, N = Total Respondents.

SEM-PLS is a statistical analysis to evaluate models consisting of linear relationships between variables that are usually latent variables that cannot be observed directly. There are two model evaluations: the measurement model evaluation (Outer Model) which aims to prove that the measurement model is valid and reliable [13], and the structural model evaluation (Inner Model) which aims to predict relationships between latent variables based on substantive theory using R-square for endogenous constructs and t-statistic values from path coefficient testing [14].

## III. RESULTS AND DISCUSSION

➢ *Respondent Characteristics*

Based on data collected from 35 respondents, respondent characteristics show that the majority of respondents were aged 31-40 years (48%), male (80%), had a bachelor's degree in engineering (54%), had 6-10 years of work experience (37%), had competency certificates (57%), and served as Department Supervisors (86%).

➢ *Outer Model Test Results*

The outer model testing was conducted to ensure that the instruments used to measure latent variables had good validity and reliability. Based on the first stage loading factor test results, there were 7 indicators that did not meet the critical value of 0.7: X6.1 (Non-physical work environment) with a value of 0.521, Y1.5 (Minimal work defects) with a value of 0.651, Y1.10 (Working hours) with a value of 0.689, Y1.14 (Contractor transparency and honesty) with a value of 0.671, Y1.15 (Proactive and solution-oriented capability) with a value of 0.644, Y1.16 (Quality of meetings and discussions) with a value of 0.513, and Y1.17 (Work reporting) with a value of 0.449. These seven indicators were removed and retested.

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Table 3 Loading Factor Test Results - Stage 2

| Construct | Indicator | Loading Factor Value | Critical Value | Description |
|---|---|---|---|---|
| Human Resources (X1) | X1.1 | 0,861 | 0,7 | Valid |
| | X1.2 | 0,764 | 0,7 | Valid |
| | X1.3 | 0,778 | 0,7 | Valid |
| Finance (X2) | X2.1 | 0,861 | 0,7 | Valid |
| | X2.2 | 0,849 | 0,7 | Valid |
| | X2.3 | 0,884 | 0,7 | Valid |
| Equipment (X3) | X3.1 | 0,829 | 0,7 | Valid |
| | X3.2 | 0,848 | 0,7 | Valid |
| | X3.3 | 0,834 | 0,7 | Valid |
| Material (X4) | X4.1 | 0,837 | 0,7 | Valid |
| | X4.2 | 0,861 | 0,7 | Valid |
| | X4.3 | 0,898 | 0,7 | Valid |
| Methods (X5) | X5.1 | 0,908 | 0,7 | Valid |
| | X5.2 | 0,824 | 0,7 | Valid |
| | X5.3 | 0,796 | 0,7 | Valid |
| Environment (X6) | X6.2 | 0,954 | 0,7 | Valid |
| | X6.3 | 0,969 | 0,7 | Valid |
| User Satisfaction (Y1) | Y1.1 | 0,797 | 0,7 | Valid |
| | Y1.2 | 0,825 | 0,7 | Valid |
| | Y1.3 | 0,759 | 0,7 | Valid |
| | Y1.4 | 0,758 | 0,7 | Valid |
| | Y1.6 | 0,804 | 0,7 | Valid |
| | Y1.7 | 0,755 | 0,7 | Valid |
| | Y1.8 | 0,781 | 0,7 | Valid |
| | Y1.9 | 0,756 | 0,7 | Valid |
| | Y1.11 | 0,715 | 0,7 | Valid |
| | Y1.12 | 0,807 | 0,7 | Valid |
| | Y1.13 | 0,754 | 0,7 | Valid |

Source: SmartPLS Analysis Results, 2026

The Average Variance Extracted (AVE) test results show that all variables have AVE values greater than 0.5, so all seven variables are declared valid.

Table 4 Hasil Uji Nilai Average Variance Extracted (AVE)

| Variable | Average Variance Extracted (AVE) | Description |
|---|---|---|
| User Satisfaction | 0,599 | Valid |
| Finance | 0,747 | Valid |
| Work Environment | 0,925 | Valid |
| Material | 0,749 | Valid |
| Methods | 0,713 | Valid |
| Equipment | 0,701 | Valid |
| Human Resources | 0,643 | Valid |

Source: SmartPLS Analysis Results, 2026

The Cronbach's Alpha and Composite Reliability test results show that all variable values are greater than 0.7, so all variables are declared to have good reliability.

Table 5 Cronbach's Alpha and Composite Reliability Test Results

| Variable | Cronbach's Alpha | Composite Reliability | Description |
|---|---|---|---|
| Human Resources (X1) | 0,725 | 0,736 | Reliable |
| Finance(X2) | 0,833 | 0,844 | Reliable |
| Equipment(X3) | 0,789 | 0,804 | Reliable |
| Material (X4) | 0,834 | 0,847 | Reliable |
| Methods (X5) | 0,804 | 0,884 | Reliable |
| Methods (X5) | 0,919 | 0,946 | Reliable |
| User Satisfaction (Y1) | 0,933 | 0,936 | Reliable |

Source: SmartPLS Analysis Results, 2026

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➢ *Inner Model Test Results*

R-Square ($R^2$) test results show a value of 0.789, meaning that 78.9% of the user satisfaction variable can be explained by the independent variables in the model, while the remaining 21.1% is influenced by other factors outside the model.

The Effect Size ($f^2$) test results indicate that the material variable has an $f^2$ value of 0.236, which falls into the large effect category, while the equipment variable has an $f^2$ value of 0.147 (medium effect) and the finance variable has an $f^2$ value of 0.145 (medium effect). The remaining variables demonstrated small effect sizes.

Table 6 Effect Size ($f^2$) Test Results

| Variable | User Satisfaction (Y1) |
|---|---|
| Finance (X2) | 0,145 |
| Work Environment (X6) | 0,013 |
| Material (X4) | 0,236 |
| Methods (X5) | 0,047 |
| Equipment (X3) | 0,147 |
| Human Resource (X1) | 0,017 |

Source: SmartPLS Analys Results, 2026

The significance test results show that the material and equipment variables have a positive and significant effect on user satisfaction with P-values of 0.007 and 0.030, respectively. Meanwhile, the finance, work environment, work methods, and human resources variables have a positive but not significant effect on user satisfaction.

Table 7 Path Coefficient Significance Test Results

| Path Coefficient | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics | P values | Description |
|---|---|---|---|---|---|---|
| Finance→ User Satisfaction | 0,294 | 0,296 | 0,211 | 1,397 | 0,081 | Not Proven |
| Work Environment→ User Satisfaction | -0,09 | -0,073 | 0,152 | 0,594 | 0,276 | Not Proven |
| Material→ User Satisfaction | 0,334 | 0,296 | 0,137 | 2,439 | 0,007 | Proven |
| Methods→ User Satisfaction (Y1) | 0,155 | 0,151 | 0,168 | 0,924 | 0,178 | Not Proven |
| Equipment→ User Satisfaction | 0,331 | 0,322 | 0,176 | 1,878 | 0,03 | Proven |
| Human Resources →User Satisfaction | 0,092 | 0,12 | 0,176 | 0,522 | 0,301 | Not Proven |

Source: SmartPLS Analysis Results, 2026

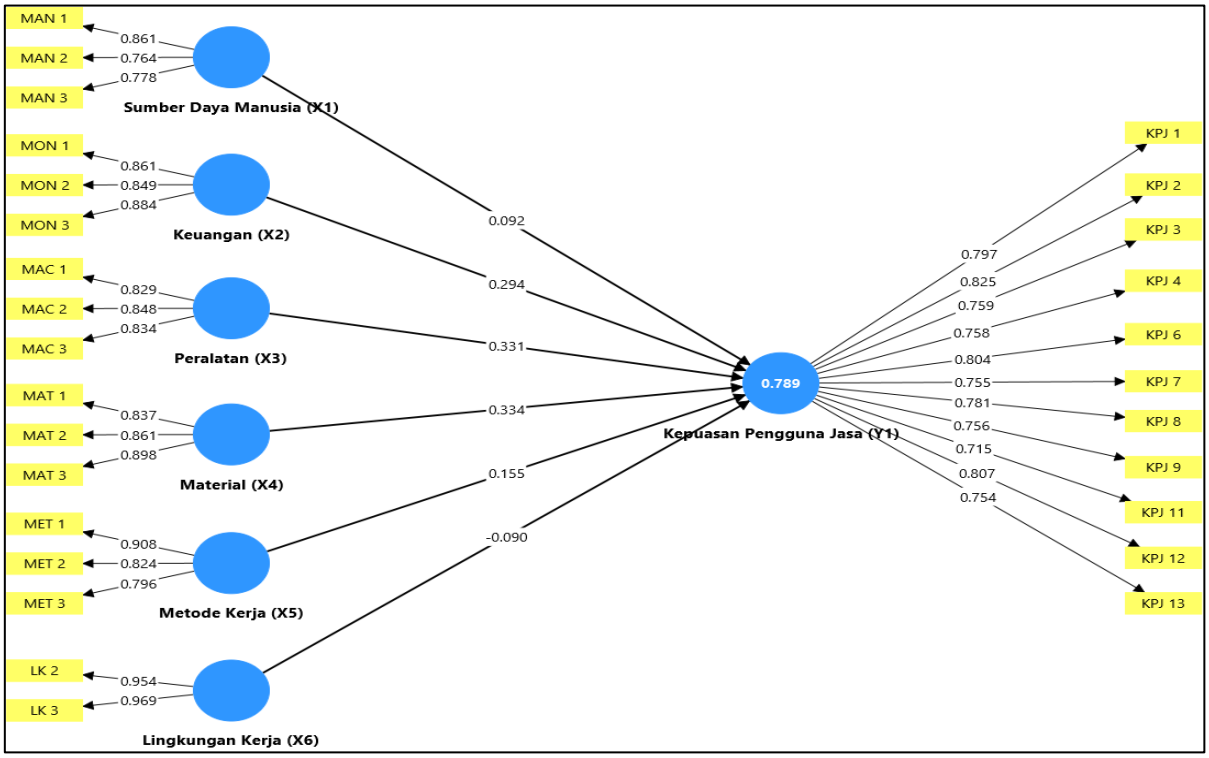


Fig 1 PLS SEM Algorithm Output Model

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➢ *Relative Importance Index (RII) Test Results*

Based on the RII test results on contractor performance variables, the most influential indicator is specifications and material testing results with an RII value of 0.709, followed by material quality (0.697), contractor project administration (0.657), contractor work motivation (0.651), and work methods (0.651). The indicator with the lowest RII value is the feasibility condition of equipment used for work with an RII value of 0.589 (medium category).

Table 8 Summary of Relative Importance Index Results for Contractor Performance

| No. | Indicator | RII | Level of Influence |
|---|---|---|---|
| 1 | Specifications and material testing results | 0,709 | High |
| 2 | Quality of materials used | 0,697 | High |
| 3 | Contractor project administration | 0,657 | High |
| 4 | Contractor work motivation | 0,651 | High |
| 5 | Work methods used in the construction process | 0,651 | High |
| 6 | Work experience aligned with the project undertaken | 0,640 | High |
| 7 | Contractor work discipline | 0,634 | High |
| 8 | Material availability and supply | 0,634 | High |
| 9 | Work skills of the contractor company | 0,629 | High |
| 10 | Monthly certificate aligned with work progress | 0,623 | High |
| 11 | Equipment management and operation | 0,623 | High |
| 12 | Non-physical work environment | 0,623 | High |
| 13 | Contractor company finances are adequate | 0,617 | High |
| 14 | Implementation of occupational safety and health | 0,611 | High |
| 15 | Contractor financial management | 0,606 | High |
| 16 | Completeness of equipment used for work | 0,600 | High |
| 17 | Feasibility condition of equipment used for work | 0,589 | Medium |

Source: Analysis Results, 2026

For user satisfaction variables, there are three indicators with the highest equal RII values: conformity of work with the budget plan, contractor understanding of user needs, and proactive and solution-oriented capability when facing field problems, each with an RII value of 0.663.

Table 9 Relative Importance Index Results for User Satisfaction

| No. | Indicator | RII | Level of Influence |
|---|---|---|---|
| 1 | Conformity of work with the budget plan | 0,663 | High |
| 2 | Contractor understanding of user (owner) needs | 0,663 | High |
| 3 | Proactive and solution-oriented capability when facing field problems | 0,663 | High |
| 4 | Conformity of work with working drawings | 0,657 | High |
| 5 | Working hours during project implementation | 0,651 | High |
| 6 | Conformity of work with technical specifications | 0,640 | High |
| 7 | Work reporting (daily, weekly, monthly) to users | 0,623 | High |
| 8 | Conformity of work with terms of reference | 0,617 | High |
| 9 | Work adjustment to environmental conditions | 0,617 | High |
| 10 | Contractor transparency and honesty during construction | 0,617 | High |
| 11 | Quality of meetings and discussions with users | 0,617 | High |
| 12 | Minimal work defects | 0,611 | High |
| 13 | Clarity and completeness of information provided by contractor | 0,606 | High |
| 14 | Responsive and timely to user requests and complaints | 0,600 | High |
| 15 | Rework (if demolition is done due to non-compliance with planning) | 0,589 | Medium |
| 16 | On-time/earlier project completion | 0,577 | Medium |
| 17 | Conformity of weekly/monthly work schedules with actual field conditions | 0,571 | Medium |

Source: Analysis Results, 2026

➢ *Discussion*

Based on the research results, contractor performance represented by six latent variables (human resources, finance, equipment, material, work methods, and work environment) has a very strong contribution in shaping user satisfaction with an $R^2$ value of 0.789. This is in line with the findings of Syahroni and Siswoyo [2] which showed that owner satisfaction with contractor performance at the Public Works and Spatial Planning Department of Lumajang Regency was in the satisfied category with a CSI value of 66.32%.

The material variable has a positive and significant effect on user satisfaction. In the construction industry,

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especially in road and bridge development, materials such as asphalt, ready-mix concrete, aggregates, and reinforcing steel are the main components of the physical structure. Timeliness of material delivery, conformity of specifications with laboratory standards, and minimal material quality defects are the main indicators that define project quality success. This is reinforced by the RII test results which show specifications and material testing results as the most dominant factor (RII = 0.709).

The equipment variable also has a positive and significant effect on user satisfaction. The characteristic of road projects that are highly dependent on the existence of heavy equipment such as excavators, vibratory rollers, and asphalt finishers is absolute. When equipment is able to work at maximum capacity with minimal downtime, the work rhythm in the field is maintained, which is positively assessed by users. However, the RII test results show that equipment feasibility condition has the lowest value (RII = 0.589), thus requiring improvement strategies such as strict periodic maintenance, spare parts management at the project site, and operator qualification with official Operator Licenses (SIO).

The human resources, finance, work methods, and work environment variables show an insignificant effect on user satisfaction. This can be explained by the characteristics of users in North Morowali Regency who tend to be oriented towards the final physical object (product-oriented) rather than the process of individual contractor personnel competence (process-oriented). As long as the road and bridge projects they work on are built, the limitations or dynamics of internal contractor performance tend to be ignored.

For user satisfaction, there are three main indicators with balanced RII values (0.663): conformity of work with the budget plan, contractor understanding of owner needs, and proactive and solution-oriented capability when facing field problems. These three indicators show that users pay great attention to budget compliance, understanding of needs, and contractor problem-solving capabilities.

## IV. CONCLUSION

Based on the analysis and discussion that has been conducted, the research conclusions are as follows:

- Contractor performance represented by six latent variables (human resources, finance, equipment, material, work methods, and work environment) has a very strong contribution in shaping user satisfaction. This is evidenced by the R-Square ($R^2$) value of 0.789, indicating that 78.9% of the variation in user satisfaction level is influenced by contractor performance variables.
- The RII test results show that the specifications and material testing results indicator is the most dominant factor affecting contractor performance with an RII value of 0.709.
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