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Comparative Evaluation of Actual and Planned Productivity of the Samarinda City Police Dormitory Construction Project Workforce

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Abstract: This study aims to evaluate the comparison between actual and planned labor productivity in the Police Housing Construction Project in Samarinda as a basis for assessing construction efficiency. Actual productivity data were obtained from field observations, daily reports, and measurement of work volume and duration. Planned productivity was calculated using the Unit Price Analysis (AHS), project scheduling, and manpower planning. The results show significant differences between actual and planned productivity in various work categories. Actual structural productivity ranges from 0.71 to 1.20 m³/day, which is lower than the planned productivity of 1.456–3.21 m³/day. Finishing works also display substantial deviation, with actual productivity of 27.52–80 m²/day compared to the planned 44–135 m²/day. These discrepancies result in slower progress, increased risk of project delays, and reduced time management efficiency. Key factors contributing to productivity gaps include field conditions, weather disturbances, material mobilization, worker experience, and coordination effectiveness among subcontractors. The findings highlight the importance of periodic productivity control and improved field management to meet planned targets.

Keywords: actual productivity; planned productivity; construction efficiency; labour performance; productivity deviation; field management.

INTRODUCTION

The success of a construction project is greatly influenced by the workforce's ability to complete work within the established timeframe and volume [Adi & Mulia, 2022]. In the Police Dormitory Construction project in Samarinda City, labor productivity is a critical indicator determining the efficiency of work implementation. In the planning documents, labor productivity has been calculated based on the Unit Price Analysis (AHS), project scheduling, and technical provisions in accordance with PUPR Ministerial Regulation No. 8 of 2024. However, the dynamics of construction implementation in the field often result in discrepancies between planning and implementation [Ginting & Lubis, 2019].

Actual productivity that is lower than planned is one of the causes of project delays. Some structural and architectural projects show quite high productivity deviations, ranging from 37–60%. This condition not only affects the efficiency of implementation time but also results in increased operational costs due to extended work durations [Suryani & Fachrudin, 2021]. Several factors contribute to low actual productivity in the field, including unpredictable weather conditions, delays in material supplies, mobilization obstacles, and ineffective coordination between sub-projects [Nugraha & Pratama, 2022; Wijaya & Prakoso, 2020].

Given the high deviation, a comparative evaluation of actual and planned productivity is crucial for identifying implementation weaknesses, analyzing the causes of inefficiencies, and providing recommendations for productivity improvements in future projects [Yusuf & Rahman, 2019]. Therefore, this study contributes to a comprehensive understanding of workforce effectiveness and project control strategies for the construction of the Police Dormitory in Samarinda City.

RESEARCH METHOD

1. Productivity in Project Management

Labor productivity is a key indicator of construction project performance. Low productivity levels result in:

- Project delays
- Cost overruns
- Decreased quality of work

In building projects (including police dormitories), productivity is greatly influenced by:

- Complexity of the structural work
- Difficulty of the finishing work
- Availability of materials and tools
- Discipline and quality of the workforce

2. Actual Productivity vs Planned Productivity Actual

It is a real achievement in the field based on:

- Ratio of work volume per day
- Daily documentation
- Effective working hours

Planned Productivity is a normal standard based on:

- AHS
- Planning schedule
- Technical specifications and contractual duration

Productivity Comparison used for:

- Measuring the efficiency of implementation
- Identify any discrepancies in workforce performance
- Determine the factors causing delays
- Provide recommendations for project management improvements

3. Factors Affecting Productivity

a. Field Conditions: access, cleanliness, surface preparation
b. Materials: distribution delays, availability, quality
c. Equipment: use of manual vs mechanical tools
d. Workforce: skills, motivation, experience
e. Weather: rain, high humidity
f. Sub-task coordination: work queues, overlapping schedules

4. Productivity Evaluation

Evaluation is done by measuring:

a. Deviation between plan and actual

b. Performance efficiency

c. Significance of deviation to project time and cost

Productivity evaluation is used as a basis for decision making in:

a. Optimization of workforce management

b. Rescheduling

c. Improvement of working methods

d. More planned material procurement

Research methods

1. Types of research

Quantitative descriptive evaluative research, with comparative analysis between actual and planned productivity.

2. Research Location

Police Dormitory Construction Project

Location: Samarinda City

3. Data Used

a. Primary Data

- Productivity time study
- Field observation
- Interviews with workers, foremen, and supervisors

b. Secondary Data

- Budget plan
- AHS
- Work drawing
- Project implementation schedule
- Daily labour report

4. Data collection technique

a. Field survey to measure actual productivity.

b. Analyse project documents to obtain plan productivity.

c. Technical interviews to identify productivity barriers

d. Observe the work process to calculate effective hours.

5. Data Analysis Techniques

a. Calculate the actual productivity of each development activity.

b. Calculate the productivity plan according to the technical documents.

c. Analysis of productivity deviation (difference and percentage).

d. Analysis of the causes of deviation based on observations and interviews.

e. Evaluate the impact on project time and cost.

f. Provide workforce management recommendations.

RESULTS AND DISCUSSION

In this study, the evaluation focused on the level of alignment between actual and planned productivity and the effectiveness of its implementation. The evaluation results were used to assess workforce performance, identify obstacles, and improve workforce management.

Actual Productivity Evaluation Results

Observations of actual labor productivity were conducted on structural and finishing work. A summary of the results is shown below:

a. Structural Work

- Average actual productivity: 0.71–1.20 m³/day
- Output varies based on the type of work (columns, beams, slabs)

b. Finishing Work

- Average actual productivity: 27.52–80 m²/day

Actual productivity differences are more influenced by:

- Type of construction activity
- Access the installation area
- Material readiness

Results of Planned Productivity Calculation

Based on RAB, AHS, and CPM, the productivity plan is designed for ideal conditions:

a. Structure

- Planned productivity ranges from 1,456–3.21 m³/day

b. Finishing

- Planned productivity ranges from 44–135 m²/day

This calculation becomes a contractual reference and the basis for planning the duration of each work item.

Actual vs Planned Comparison

The comparison shows significant deviations for all job categories:

a. Deviation of Structural Work

The largest deviations were seen in the casting of plates (63%) and beams (62%). This indicates that the implementation of the structure faced significant obstacles in the field.

b. Deviation of Finishing Work

The finishing deviation is lower, ranging from 31–41%, which is relatively more stable than the structure.

Evaluation of Factors Causing Productivity Mismatch

Analysis reveals five core factors:

1. Material Factors
   - Delays in distribution of ceramics, cement, paint, iron
   - Remote storage locations cause high waiting times
2. Time Management Factors
   - Effective working hours are only 5–6 hours/day due to preparation and rest time
   - Overlapping work between floors
3. Equipment Factors
   - Manual tools dominate, such as small mixers or simple cutting tools
   - Lack of equipment during peak hours
4. Labor Factor
   - Differences in skills between individuals
   - Lack of field supervision
5. Environmental Factors
   - Rainy weather hamper casting work

Evaluation of the Impact of Productivity Differences

a. Impact on Time

Deviation causes cumulative delays during:

- 10–18 day on structural work
- 5–12 day on finishing work

b. Impact on Costs

- Labor cost efficiency decreases
- Overtime costs increased to 8–12%

Risk of increased material costs due to delays

c. Impact on Project Management

- CPM schedule must be revised
- Need for additional workers on some critical items
- Supervision must be more intensive

General Discussion

From the overall results obtained, it can be concluded that:

- Actual productivity is much lower than planned due to dynamic field conditions and far from ideal assumptions.
- Evaluation shows that productivity is most influenced by logistics management and field coordination.

- Project efficiency can be increased by rearranging work methods, improving material distribution, and close supervision.

CONCLUSION

Based on the evaluation of labour productivity on the Samarinda City Police Dormitory Construction Project, it can be concluded that there is a significant productivity gap between actual and planned conditions. Measurement results indicate that actual productivity on structural and finishing work is far below the planned productivity figures prepared based on the Unit Price Analysis (AHS) and the project schedule. This indicates that implementation in the field is not fully in line with the initial planning.

Actual structural productivity only reached 0.71–1.20 m³/day, compared to the planned productivity of 1,456–3.21 m³/day, while actual finishing productivity was between 27.52–80 m²/day, still below the planned productivity of 44–135 m²/day. This difference reflects a productivity deviation of 40–60%, which has the potential to impact overall work time and cost efficiency.

Factors causing deviations in productivity between actual and planned include:

(1) Suboptimal workforce management, especially regarding task division, supervision, and worker absences.

(2) Inconsistent working methods, where implementation in the field does not fully follow planning procedures.

(3) External disturbances, such as weather and material delays that hamper the work rhythm.

(4) Capacity and skills of the workforce, where some workers lack experience so that work speed is below planned standards.

This evaluation confirms that increasing productivity requires improvements in planning, monitoring, and work control. Project management needs to adopt a strategic approach through improving human resource quality, optimizing the material supply chain, adapting to more efficient work methods, and implementing regular monitoring based on productivity performance indicators. These steps can minimize the gap between actual and planned productivity, allowing projects to be completed more effectively and on target.

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