



# THE INFLUENCE OF TALENT MANAGEMENT, MOTIVATION, AND ENGAGEMENT ON EMPLOYEE PRODUCTIVITY AT PT GSI STEEL MELTING PLANT

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## Article Info

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## ABSTRACT

Employee productivity is a key factor in organizational success in labour-intensive industries, such as steel smelters. PT GSI faces the challenge of low productivity, as reflected in increased employee absenteeism and job dissatisfaction, despite implementing various management policies. Therefore, this study aims to analyze the effects of talent management, motivation, and Employee Engagement on employee productivity and to test the mediating roles of motivation and engagement. This study employs a quantitative approach with a survey design, selecting a random sample of 153 permanent employees from PT GSI. Data collection was conducted through a questionnaire, whose validity and reliability were assessed using Cronbach's Alpha method and Confirmatory Factor Analysis (CFA). Furthermore, data analysis was conducted using Partial Least Squares (PLS) and Structural Equation Modelling (SEM) techniques, with a significance level of  $p < 0.05$ . The results showed that talent management had a significant effect on employee motivation ( $\beta = 0.689, p < 0.01$ ) and engagement ( $\beta = 0.568, p < 0.01$ ). Additionally, motivation and engagement have been proven to have a significant impact on employee productivity. PLS-SEM path analysis reveals motivation and engagement as effective mediating variables in the relationship between talent management and employee productivity. This study provides academic and practical contributions by revealing the mechanism of productivity improvement through talent management. The implication is that PT GSI needs to develop policies that support talent development, increase employee motivation, and encourage engagement to optimize company productivity.

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## 1. INTRODUCTION

Globalization has reshaped the competitive landscape of global industries, compelling companies to continually enhance their efficiency and productivity [1], [2]. The steel industry, as one of the fundamental pillars of economic development, faces complex challenges in transforming human resource potential into competitive advantages [3], [4]. In Indonesia, the steel sector plays a strategic role in supporting national

infrastructure development. With national production capacity increasing from 15.57 million tons in 2022 to 16.85 million tons in 2023, this industry not only contributes to economic growth but also creates a dynamic industrial ecosystem [5]. Although data shows an increase in production capacity, the ongoing productivity challenges in this sector require further attention.

PT GSI, an integrated steel producer in Medan, North Sumatra, is facing the complexity of organizational transformation that requires a strategic approach to human resource management. Previous studies by Saks and Gruman (2014) [6] and Chen Y et al (2023) [7] have emphasized that employee productivity is no longer just a measure of quantitative output but rather a complex representation of the interaction between talent management, motivation, and employee engagement. Empirical observations at PT GSI reveal an interesting phenomenon. Despite having modern production facilities and optimal capacity, the company experienced a significant decline in productivity. External factors such as fluctuations in raw material prices, regulatory changes, and global competition are exacerbated by internal challenges, including low work motivation, minimal employee engagement, and a gap between human resource potential and actual performance [8]. Data from the Ministry of Industry shows that the productivity of the steel manufacturing sector in Indonesia is recorded as lower than the average of ASEAN countries, which increases the urgency of this research.

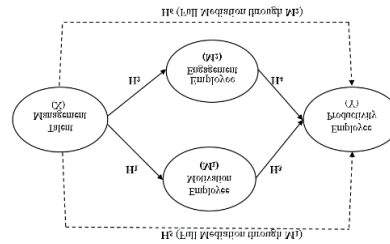
Although several studies, such as Abdullahi et al. (2022) and Chen Y et al (2023), have explored the relationship between talent management and productivity, a significant research gap remains in the steel industry context. Most previous studies are still partial and do not comprehensively integrate the mediating role of employee motivation and engagement in improving productivity. Additionally, existing studies often overlook the specific context of the Indonesian steel industry, which presents unique challenges related to employee motivation and human resource management dynamics.

In this context, this study aims to explore and analyze the complex relationship between talent management, motivation, employee engagement, and productivity within the PT GSI Steel Melting Plant environment. The primary focus of the study is to analyze the influence of talent management on employee motivation and engagement, as well as to examine the impact of motivation and engagement on productivity. This study also examines the mediating role of employee motivation and engagement in transforming the impact of talent management on increased productivity. Thus, this study aims to fill this gap by proposing a holistic analysis model that integrates talent management, motivation, and employee engagement, thus providing a new perspective in understanding the mechanism of productivity improvement in the manufacturing sector. This study makes a significant contribution by providing practical recommendations for managers in the steel industry to optimise employee engagement and motivation, which is expected to support substantial improvements in productivity.

Socio-technical systems theory (Passmore et al., 1982) offers a relevant conceptual framework for understanding these dynamics. In the context of PT GSI, this theory suggests that optimising productivity requires a balance between social subsystems (talent management, motivation, and engagement) and technical subsystems (production technology and management systems). Through this comprehensive approach, the study aims to identify strategic mechanisms that enable organisations to optimise their human resource potential, providing in-depth insights into the internal dynamics that influence employee performance and generating practical recommendations for the development of more effective human resource management strategies in the steel manufacturing industry.

#### Framework of Thinking

This framework describes the relationship between talent management variables (X) and employee productivity (Y), which is mediated by employee motivation (M1) and employee engagement (M2).



**Figure 1.** Framework of Thinking on the Influence of Talent Management on Employee Productivity Mediated by Employee Motivation and Engagement at PT GSI Steel Melting Plant

Figure 1 explains that:

H1: Talent management has an effect on employee motivation

H2: Talent management has an impact on employee engagement

H3: Employee motivation has an effect on productivity

H4: Employee engagement has an impact on productivity

H5: Motivation fully mediates the relationship between talent management and productivity.

H6: Employee engagement fully mediates the relationship between talent management and productivity.

## 2. RESEARCH METHODS

This research is motivated by the challenges faced by the manufacturing industry, particularly at the PT GSI Steel Melting Plant, in optimising employee productivity during the era of digital transformation. With a 15.5% decline in productivity over the last two years, as reported in the PT GSI internal performance analysis (2023), it is crucial to identify the factors that impact employee performance. Therefore, this study adopts a quantitative approach with a causal-explanatory research design, aiming to understand the causal relationship between talent management, motivation, employee engagement, and employee productivity within the company.

The research process begins with the preparation stage, where the researcher conducted a preliminary study to identify the specific challenges faced by PT GSI. After understanding the existing context, the researcher prepared a research proposal and obtained permission from the company's management to proceed with the research. A questionnaire was developed to measure relevant variables, namely talent management, motivation, employee engagement, and productivity. Before being distributed, the questionnaire was tested to ensure its validity and reliability. The testing procedure included validity testing using Confirmatory Factor Analysis (CFA) to assess construct validity and reliability testing using Cronbach's Alpha method. Validity criteria were determined with a loading factor of more than 0.5 and an alpha value above 0.7 was considered reliable (Hair et al., 2010).

Data were collected by distributing questionnaires to 153 permanent employees selected through purposive sampling techniques that met specific criteria, including those in the production unit who had worked for at least one year, had a good understanding of the production process, and were willing to participate as respondents. The population studied consisted of 600 employees. After the data was collected, the data was processed through a scoring and tabulation process. The analysis was carried out using the path analysis method (PLS-SEM) to test the formulated hypothesis. The analysis process includes the Measurement Model test to assess construct validity and the Structural Model test to assess the relationship between variables (Henseler et al., 2009). Hypothesis testing was conducted using the Bootstrapping method, examining the t-statistic value, p-value, and path coefficient to determine the significance, strength, and direction of the relationship between variables. Based on the theoretical framework developed, the variables in this study consist of independent variables (X), namely Talent Management; mediating variables (M), consisting of Motivation and Engagement; and dependent variables (Y), namely Employee Productivity. This study has also obtained ethical approval from PT GSI, and all respondents provided informed consent, with an adequate explanation of the study's purpose and procedures, to ensure confidentiality and maintain the ethics of participation.

### 3. RESULT AND ANALYSIS

Table 1 below shows the demographic characteristics of the respondents involved in the study. In total, 153 respondents participated, with the majority being employees of the PT GSI Steel Melting Plant.

**Table 1.** Respondent Profile

Characteristics	Category	Frequency	Percentage
Gender	Man	153	100%
Age	26-30 years	5	3.27%
	31-35 years	10	6.54%
	36-40 years	37	24.18%
	> 40 years	101	66.01%
Education	High School/ Vocational School	133	86.93%
	Diploma	6	3.92%
	Masters	11	7.19%
	Postgraduate	1	0.65%
Length of work	< 3 years	3	1.96%
	6-10 years	3	1.96%
	10-15 years	21	13.73%
	> 15 years	126	82.35%

The data above show that employee responses were successfully collected, with all respondents being male and most having a high school or vocational high school education.

#### Descriptive Analysis of Variables

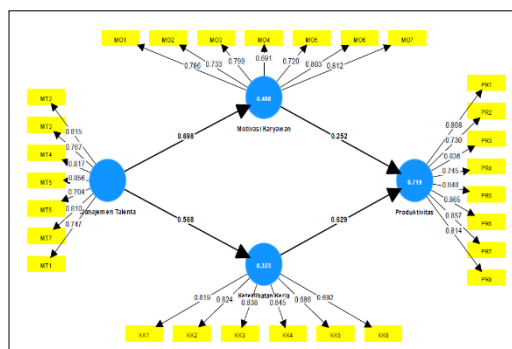
Table 2 presents the results of the descriptive analysis for each of the variables studied: Talent Management, Employee Motivation, Employee Engagement, and Employee Productivity. The measure used is a Likert scale from 1 (very low) to 5 (very high).

**Table 2.** Descriptive Statistics of Research Variables

Variables	Rate-rate	Standard Deviation	Category
Talent Management	4.22	0.70	High
Employee Motivation	3.98	0.82	Moderate
Employee Engagement	4.05	0.65	High
Employee Productivity	4.00	0.75	Moderate

The results of the descriptive analysis indicate that the variables Talent Management and Employee Engagement fall into the high category, while Employee Motivation and Employee Productivity are categorised as moderate.

#### Instrument Test Results



**Figure 2.** Results of Path Analysis of Influence Talent Management to Productivity

Information:

- The numbers on the lines indicate path coefficient
- Arrows show direction relationship between variables

- Variables: MT (Talent Management),  
MO (Motivation),  
KK (Employee Engagement),  
PR (Productivity)

In the path analysis shown in Figure 2, the relationship between the key variables in this study is visible. This model demonstrates that Talent Management plays a crucial role as a trigger factor in enhancing Employee Motivation and Engagement. As emphasised by Collings and Mellahi (2009), effective talent management can significantly enhance a company's competitive advantage. Ryan and Deci (2000b) emphasise the importance of motivation in driving optimal performance, which is evident in the significant impact of motivation on productivity. Furthermore, Bakker and Demerouti (2008) note that employee engagement plays a significant role in enhancing productivity, which aligns with the findings presented in Figure 2. Employee Engagement, which Talent Management also influences, has a more substantial impact on productivity, underscoring the importance of engagement in enhancing work outcomes. The interactions between variables not only provide information on direct effects but also show the complex network in which the relationships operate. Thus, these findings support the importance of Talent Management strategies in the context of organizational productivity.

**Table 3. Validity Test Results (Factor Loading)**

Variables	Indicator	Factor Loading	Is	Variables	Indicator	Factor Loading	Is
Management	MT1	0.747	Valid	Motivation	MO1	0.786	Valid
Talent	MT2	0.815	Valid	Employee	MO2	0.733	Valid
	MT3	0.767	Valid		MO3	0.799	Valid
	MT4	0.817	Valid		MO4	0.691	Valid
	MT5	0.856	Valid		MO5	0.720	Valid
	MT6	0.704	Valid		MO6	0.803	Valid
	MT7	0.810	Valid		MO7	0.812	Valid
Engagement	KK1	0.819	Valid	Productivity	PR1	0.808	Valid
	KK2	0.824	Valid		PR2	0.730	Valid
	KK3	0.838	Valid		PR3	0.836	Valid
	KK4	0.845	Valid		PR4	0.745	Valid
	KK5	0.845	Valid		PR5	0.848	Valid
	KK6	0.692	Valid		PR6	0.865	Valid
					PR7	0.857	Valid
					PR8	0.814	Valid

Table 3 presents the validity test, showing that all indicators meet the validity standards, with factor loading values of more than 0.5 for all indicators. The construct reliability is also demonstrated by Cronbach's Alpha values of more than 0.7, indicating that the constructs in this study are suitable for use.

**Table 4. Reliability Test Results**

Variables	Cronbach's Alpha	Composite Reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	Information
Talent Management	0.899	0.905	0.920	0.623	Reliable
Employee Motivation	0.881	0.885	0.908	0.585	Reliable
Employee Engagement	0.875	0.884	0.906	0.619	Reliable
Productivity	0.927	0.933	0.940	0.663	Reliable

The test results in Table 4 indicate that all constructs exhibit good construct validity. The AVE value confirms this, with all variables obtaining values > 0.5. All constructs can also be considered consistent with Cronbach's Alpha and Composite Reliability values greater than 0.7. Therefore, the model studied can be said to have met the validity and reliability aspects of the test.

#### SEM-PLS Analysis Results

**Table 5. R-Square Results**

Variables	R-square	R-square adjusted
Motivation	0.488	0.484
Employee Engagement	0.323	0.318
Productivity	0.719	0.715

The test results in Table 5 indicate that the variables of motivation and employee involvement can be explained by Talent Management, accounting for 48.4% and 31.8%, respectively. This figure shows that the proportion of Talent Management in both is quite significant (over 30 per cent). Furthermore, Productivity can be explained by the three predictor variables – Talent Management, Motivation, and Employee Involvement – at a rate of 71.5 per cent. This highlights the significance of the three variables in determining employee productivity at PT GSI, as evidenced by the R<sup>2</sup> test results, which indicate that the role of variables outside the research model accounts for only 28.5 per cent.

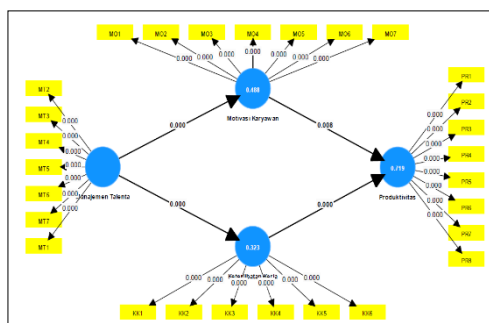


Figure 3. Bootstrapping Result Diagram

Information:

- The numbers on the lines indicate path coefficient estimation
- Arrows indicate the direction of the relationship between variables
- Variables: MT (Talent Management),  
MO (Motivation),  
KK (Employee Engagement),  
PR (Productivity)
- The coefficients displayed are bootstrapping results

In the bootstrapping test results, all relationship paths between variables show a significance level of 0.000. This indicates that the relationship inter-variable is highly statistically significant. Additionally, the research model exhibits strong validity, as supported by the consistency of the path analysis results obtained. With the support of empirical data, all research hypotheses can also be relevant to the reality in the field. The value of 0.000 on each path indicates that the probability of error is very low ( $p < 0.05$ ). Thus, this model is scientifically acceptable and provides more confidence in the conclusions drawn.

Table 6. Hypothesis Testing Results

Hypothesis	Variable Relationship	Path Coefficient	P-Values	Conclusion
H1	Talent Management → Motivation	0.698	0.000	Accepted
H2	Talent Management → Employee Engagement	0.568	0.000	Accepted
H3	Motivation → Productivity	0.252	0.008	Accepted
H4	Employee Engagement → Productivity	0.629	0.000	Accepted
H5	Talent Management → Motivation → Productivity	0.176	0.011	Accepted
H6	Talent Management → Employee Engagement → Productivity	0.357	0.000	Accepted

### The Influence of Talent Management on Employee Motivation

Talent management has a significant and strong influence on employee motivation, with a path coefficient of 0.698 ( $p < 0.001$ ). This suggests that effective talent management practices can significantly enhance employee motivation at work. This finding aligns with the perspective of Almomaniet al. (2022) and Urme (2023), who emphasise that investment in individual development through talent management can increase work motivation. Ryan and Deci (2000) strengthened this argument with the Self-Determination Theory, which emphasises the importance of both intrinsic and extrinsic motivation in driving employee performance. Groenewald et al. (2024) noted that recognising individual effort and achievement through a comprehensive talent management system can enhance employee morale and self-confidence.

### The Impact of Talent Management on Employee Engagement

Talent management has a significant and strong influence on Employee Engagement, with a path coefficient of 0.568 (p-value = 0.000). This indicates that implementing talent management strategies can enhance employee engagement in the workplace. Baker and Demerouti (2008) also noted that employee engagement plays a significant role in increasing productivity. Employees who feel valued and allowed to develop will be more motivated to contribute optimally, as noted by Tamsah et al. (2023) [9], who emphasise that adequate training and career management programs can foster loyalty and engagement.

#### **The Influence of Motivation on Productivity**

Employee motivation has a significant effect on productivity, with a path coefficient of 0.252 and a p-value of 0.008. Although the contribution is relatively small, this relationship is still statistically significant. This indicates that increasing motivation has a positive impact on productivity, although its influence is not as significant as that of other variables in the model. This suggests that although motivation is crucial, other factors also impact productivity, including the work environment and managerial support. Sincerely et al. (2023) and Kurniawan et al. (2023) support this finding, explaining that talent management strategies that match employees with their skills and interests can increase motivation and productivity.

#### **The Impact of Employee Engagement on Productivity**

Employee Engagement has a powerful influence on productivity, with a path coefficient of 0.629 ( $p < 0.001$ ). This indicates that higher employee engagement is associated with increased productivity. Bakker and Demerouti (2008) support this finding, showing that employee engagement has a significant relationship with productivity. Engaged employees tend to show higher performance and contribute more.

#### **The Influence of Talent Management on Productivity through Motivation Mediation**

Motivation mediation is significant in linking talent management to productivity. Although its contribution is relatively small, Motivation is proven to act as a mediator between talent management and productivity, with a mediation path coefficient of 0.176 (p-value = 0.011). Collings and Mellahi (2009) asserted that effective talent management can enhance a company's competitive advantage, ultimately impacting productivity. Meanwhile, Ryan and Deci (2000b) [10] highlight the importance of Motivation, both intrinsic and extrinsic, in driving optimal employee performance.

#### **The Influence of Talent Management on Productivity through Mediation Involvement**

Employee Engagement contributes significantly to transforming the influence of talent management into increased productivity. Employee Engagement has a stronger mediating role than motivation, with a path coefficient of 0.357 ( $p < 0.001$ ). Wen et al. (2019) [11] noted that high employee engagement is associated with increased loyalty, which in turn leads to reduced turnover and lower costs related to recruitment and training. Research by Ilhamiyah and Harsono (2022) [12] also supports this, showing that employees who are actively involved in their work tend to perform better.

## **4. CONCLUSION**

Based on the results of statistical testing, the following can be concluded:

1. Talent management can have a significant impact on Employee Motivation and Engagement, indicating that effective talent management strategies are crucial in increasing employee motivation and employee engagement in the field.
2. Talent Management has a significant impact on Productivity through Employee Motivation and Engagement as mediating variables. This emphasises that effective talent management not only impacts motivation and engagement but also has implications for enhancing employee productivity.
3. Employee Motivation and Engagement can have a significant impact on Employee Productivity. This shows that increased motivation can support higher engagement, which in turn leads to better productivity.

#### **Suggestion**

Several suggestions can be given based on the research results:

1. Companies are advised to integrate talent management policies into their overall human resource development strategy. Planned talent management, such as ongoing training programs, career paths, career clear, and performance-based reward systems, can be a catalyst in increasing employee work motivation.
2. Companies need to create a work environment that supports optimal Employee Engagement. This can be achieved through open communication between management and employees, regular feedback, and employee involvement in decision-making related to their duties.
3. Employee Motivation and Engagement have been shown to play a crucial role in driving productivity, so organisations need to evaluate these factors consistently. Influence both variables. This approach aims to ensure that the talent management strategy implemented is always relevant and adaptive to the needs and

internal dynamics of employees. Thus, the company will be able to create productive and sustainable performance.

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