# Exploring the Interplay of Psychological Factors and Technological Innovations on Stock Accuracy in Paint Manufacturing XYZ

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A R T I C L E   I N F O

***Article history:***
*Received 02/10/2025*
*Revised 18/11/2025*
*Accepted 28/12/2025*

***JEL Classification:***

**Key words:**
*Blockchain; Inventori Berbasis Cloud; Stres Karyawan; Akurasi Persediaan; Manajemen Rantai Pasok*

A B S T R A C T

*In the paint manufacturing industry, accurate inventory levels are essential for operational efficiency, cost control, and customer satisfaction. However, issues such as reporting errors and stock discrepancies often disrupt supply chain performance. This study examines psychological and technological factors influencing Stock Accuracy (SAC), particularly Employee Stress Level in Stock Management (ESL), blockchain for Stock Data Transparency (BSD), and Cloud Inventory Management (CIM). Data were collected through questionnaires distributed to operational employees involved in stock management. Multiple regression analysis was applied to assess the relationships between variables. The results show that ESL, BSD, and CIM simultaneously have a significant effect on SAC (F-test Sig. = 0.000). However, partially only BSD (Sig. = 0.000) and CIM (Sig. = 0.001) significantly influence SAC, while ESL (Sig. = 0.761) does not. These findings indicate that technological adoption, particularly blockchain and cloud systems, plays a more direct role in improving inventory accuracy, whereas employee stress may have a limited or indirect influence.*

A B S T R A K

*Dalam industri manufaktur cat, keakuratan tingkat persediaan sangat penting untuk menjaga efisiensi operasional, pengendalian biaya, dan kepuasan pelanggan. Namun, kesalahan pelaporan dan ketidaksesuaian stok sering mengganggu kinerja rantai pasok. Penelitian ini menganalisis faktor psikologis dan teknologi yang memengaruhi Stock Accuracy (SAC), khususnya Employee Stress Level in Stock Management (ESL), blockchain untuk Stock Data Transparency (BSD), serta Cloud Inventory Management (CIM). Data dikumpulkan melalui kuesioner yang diberikan kepada karyawan operasional yang terlibat dalam pengelolaan stok. Analisis regresi berganda digunakan untuk menguji hubungan antarvariabel. Hasil penelitian menunjukkan bahwa ESL, BSD, dan CIM secara simultan berpengaruh signifikan terhadap SAC (F-test Sig. = 0.000). Namun secara parsial hanya BSD (Sig. = 0.000) dan CIM (Sig. = 0.001) yang berpengaruh signifikan terhadap SAC, sedangkan ESL (Sig. = 0.761) tidak menunjukkan pengaruh signifikan. Temuan ini menunjukkan bahwa penerapan teknologi, khususnya blockchain dan cloud, lebih berperan langsung dalam meningkatkan akurasi stok.*

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## 1. INTRODUCTION

In the paint manufacturing sector, inventory accuracy directly impacts process efficiency, costs, and customer satisfaction. With high accuracy, stockouts can be avoided, inventory turnover increases, and profitability improves (Ayantoyinbo et al., 2024). However, supply chain performance is hampered by challenges such as recording errors and data discrepancies (Tang et al., 2022). Operational and reputational damage can be caused by untimely or inaccurately reported inventory information due to poor strategic decisions arising from such data (Chakrabarty & Wang, 2021). Efficiency and transparency are enhanced by the integration of blockchain technology and cloud-based systems (Ayantoyinbo et al., 2024; Lai et al., 2023). In addition to this technology integration, reducing employee stress related to inventory management is crucial because mental well-being impacts productivity (Metalia, 2024). A sustainable and appropriate strategy for inventory management requires a combination of technology and human factors.

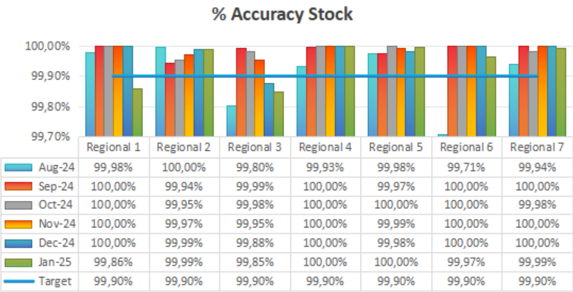


**Figure 1** XYZ company's stock data accuracy

Based on stock accuracy data from August 2024 to January 2025, almost all regions managed to maintain performance above the target of 99.90%. However, two regions showed low consistency: Region 3 and Region 6. Region 3 recorded the lowest accuracy in August (99.80%), reaching only 99.85% in January 2025, still below the target. Meanwhile, Region 6 experienced the most significant decline in August 2024 with an accuracy of 99.71%, although it then recovered to 100% in the following months. This instability indicates potential weaknesses in the stock recording and control processes in these regions, which need to be immediately evaluated to prevent negative impacts on distribution and customer satisfaction.

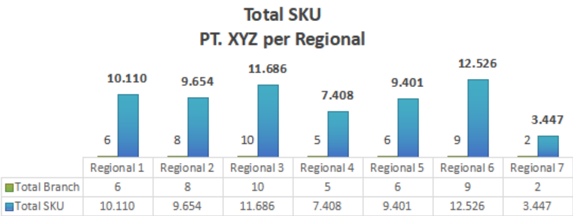


**Figure 2** Total SKU PT. XYZ company's

Psychological pressure experienced by warehouse employees can contribute to inaccurate stock data, particularly when managing large volumes of SKUs with diverse characteristics (see Figure 2). Increasing operational complexity and time pressure may heighten mental workload, reduce concentration, and lead to errors in recording or verifying stock, which can result in recurring data inconsistencies. The continued use of manual, paper-based stocktaking methods further increases the risk of mistakes, such as incorrect quantities, units, or item codes, while also slowing validation and creating additional errors during system re-entry. In large-scale warehouse operations, these limitations pose significant challenges to maintaining accurate inventory records. Therefore, improving inventory control in the paint manufacturing sector requires the integration of advanced technological systems and real-time data management, while also considering psychological aspects of work to support more reliable and efficient inventory processes.

Research on inventory accuracy frequently emphasizes technological solutions while overlooking psychological factors that may influence inventory control practices. For example, Gonzalez et al. (2024) show that inventory systems can enhance demand forecasting when psychological forecasting elements are considered. However, limited case studies examine the interaction between human factors and technology in manufacturing contexts. Studies by Zavaleta Saenz et al. (2024) and Lim et al. (2023) therefore recommend an integrated approach that combines human and technological dimensions to improve operational performance. In this context, three components are central to inventory accuracy: Employee Stress Levels (ESL), Blockchain for Stock Data Transparency (BSD), and Cloud-Based Inventory Management (CIM) systems that enhance data accessibility (Amiri, 2024; Gonzalez et al., 2024; Lim et al., 2023). Accordingly, this study aims to integrate psychological and technological perspectives into a unified framework to improve Stock Accuracy (SAC), examine the paint manufacturing sector through a case study, and formulate strategic recommendations to strengthen supply chain performance at XYZ Paint Manufacturing Company.

## 2. LITERATURE REVIEW

### *2.1 The Role of Employee Stress Levels in Stock Management to Improve SAC*

The Job Demand-Resources (JD-R) model explains that work-related stress can become a significant risk factor affecting employee productivity. Excessive workload may deplete employee resources and potentially reduce accuracy in inventory-related tasks (Bakker et al., 2025). In inventory operations, high mental workload can increase task complexity and raise the likelihood of decision errors that negatively affect organizational performance (Skulmowski & Xu, 2022; Paas & van Merriënboer, 2020). Stressors commonly encountered in

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inventory management include heavy workloads, limited processing time, system limitations, and human errors (Chua et al., 2024). Effective stress management and psychosocial support can help employees cope with work demands and maintain task precision, including inventory accuracy (Bakker et al., 2025). Previous studies also indicate that stress influences productivity and system-related performance, potentially affecting data accuracy and operational outcomes (Wei et al., 2020; Cheng et al., 2020). These findings suggest a theoretical relationship between Employee Stress Level in Stock Management (ESL) and Stock Accuracy (SAC) within organizational inventory management contexts.

**$H_1$:** ESL in Stock Management has a direct and positive influence on SAC.

*2.2 The Role of Blockchain in Data Transparency to Improve SAC*

Information transparency theory in inventory management emphasizes that real-time and immutable records enhance decision-making and operational reliability (Zilin et al., 2023). Greater supply chain visibility also helps reduce errors and improve efficiency by ensuring that inventory data is transparent and accessible (Tezel et al., 2020). In this context, blockchain technology provides key advantages such as decentralization, immutability, smart contracts, and traceability, which support more effective inventory control (Asio & Moronge, n.d., 2019; MS. K. Lakshmi Revathi Revathi et al., 2024). Its implementation enables better visibility and accuracy of inventory data, particularly in manufacturing environments, while also strengthening trust and collaboration in inventory tracking processes (Osato Itohan Oriekhoe et al., 2024). Empirical studies confirm that blockchain adoption can improve transparency, security, and transaction integration, which contribute to better operational performance and inventory accuracy (Asio & Moronge, n.d.; Zilin et al., 2023; MS. K. Lakshmi Revathi et al., 2024). However, its implementation may face challenges such as employee resistance and high adoption costs (Alsmadi et al., 2023; Khanfar et al., 2021). Despite these limitations, many scholars agree that blockchain adoption significantly supports improvements in Stock Data Transparency (BSD) and ultimately enhances Stock Accuracy (SAC).

**$H_2$:** BSD has a direct and positive effect on SAC.

*2.3 The Role of Cloud-Based Inventory Management Systems in Improving SAC*

Studies indicate that cloud-based inventory systems contribute to improved stock recording accuracy through real-time data accessibility and system integration. Research by Khayer et al. (2020) highlights that cloud computing enhances inventory visibility and accuracy by enabling real-time data access, which supports faster and more precise decision-making, as also emphasized by Sule & Oshi (2022). From the perspective of the Resource-Based View (RBV), cloud technology strengthens organizational capability by optimizing the utilization of assets and operational resources (Mkonu et al., 2019). The implementation of information technology has also been shown to improve supply chain processes and overall inventory management effectiveness through automation, synchronization, and remote accessibility (Hwang et al., 2021). Empirical studies further demonstrate that cloud computing adoption can increase operational efficiency and inventory accuracy within organizational environments (Kumar & Kumari Pal, n.d.). Although challenges such as employee resistance and training requirements may arise, cloud systems remain widely recognized for their ability to enhance inventory efficiency and reliability. These findings suggest that Cloud Inventory Management (CIM) plays an important role in improving Stock Accuracy (SAC) in manufacturing operations.

**$H_3$:** CIM has a direct and positive effect on SAC.

## 3. METHODS

3.1 Research Design

This study employed quantitative methods, collecting numerical data through a formal survey of employees at XYZ Paint Manufacturing Company. The research design used was cross-sectional, aiming to examine the relationship between psychological factors, technology, and inventory management accuracy. This method helps identify patterns, demonstrate relationships between factors, and increase the reliability of the results by considering additional variables. This approach adheres to good research standards and aligns with industry needs (Spector, 2019). Using this quantitative approach, the researcher tested hypotheses and drew general conclusions about how psychological and technological factors influence inventory accuracy. This is crucial for addressing long-term inventory management issues in the paint manufacturing industry (Van Nguyen et al., 2020; Zhuo et al., 2023).

3.2 Data Sources and Sampling Techniques

The survey was conducted using a 20-question questionnaire based on four variables from the conceptual research model: Employee Stress Levels in Stock Management (ESL), Blockchain for Stock Data Transparency (BSD), Cloud-Based Inventory Management System (CIM) Implementation, and Stock Accuracy (SAC). The questionnaire used a five-point Likert scale for responses.

To ensure respondents understood the questions, the questionnaire items were translated into Indonesian. The questionnaire was then administered directly to the respondents, who were stock management personnel at XYZ Paint Manufacturing Company. Respondents' concerns were simplified to operational leaders and logistics and inventory control experts such as warehouse managers, operators, administrators, and inspectors to ensure data accuracy and reliability.

## 4. RESULT AND DISCUSSION

*4.1 Validity Test*

In the validity analysis, a research instrument is considered valid when its correlation coefficient (r value) exceeds the critical r table value. With 51 respondents, the r table at a 5% significance level is 0.279. An item is deemed valid if the calculated r value is greater than this threshold; otherwise, it is considered invalid. The analysis results show that all variables in this study have correlation values above 0.279, indicating that every instrument used in the research meets the required validity criteria (Figure 4).

**Correlations**

| | | ESL | BSD | CIM | SAC |
|---|---|---|---|---|---|
| ESL | Pearson Correlation | 1 | .390** | .288* | .282* |
| | Sig. (2-tailed) | | .005 | .041 | .045 |
| | N | 51 | 51 | 51 | 51 |
| BSD | Pearson Correlation | .390** | 1 | .750** | .786** |
| | Sig. (2-tailed) | .005 | | .000 | .000 |
| | N | 51 | 51 | 51 | 51 |
| CIM | Pearson Correlation | .288* | .750** | 1 | .771** |
| | Sig. (2-tailed) | .041 | .000 | | .000 |
| | N | 51 | 51 | 51 | 51 |
| SAC | Pearson Correlation | .282* | .786** | .771** | 1 |
| | Sig. (2-tailed) | .045 | .000 | .000 | |
| | N | 51 | 51 | 51 | 51 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

**Figure 4** Pearson Correlation Matrix between ESL, BSD, CIM, and SAC Variables

The correlation analysis shows that Employee Stress Level in Stock Management (ESL) (X1) has a positive correlation with Stock Data Transparency (BSD) of 0.390, indicating a moderate relationship, while its correlation with Cloud Inventory Management (CIM) is lower at 0.288 but still above the validity threshold. The relationship between ESL and Stock Accuracy (SAC) (Y) is 0.282, representing a weaker yet valid correlation. Meanwhile, BSD (X2) demonstrates stronger relationships with other variables, correlating with CIM at 0.750 and with SAC at 0.786, which represents the highest correlation in this study. For CIM (X3), the correlation with ESL is 0.288, the lowest observed but still valid, while its correlations with BSD (0.750) and SAC (0.771) indicate strong relationships. Overall, all correlation values exceed the threshold of 0.279, confirming that the research instruments are valid and suitable for further analysis.

### *4.2 Reliability Test*

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .837 | 4 |

**Figure 5** Reliability Test Result Based on Cronbach's Alpha

Based on the reliability test results, the overall Cronbach's Alpha value was 0.837, exceeding the threshold of 0.6. This indicates that the research instrument has a high level of reliability and can be used consistently to measure the variables studied (Figure 5).

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| ESL | 58.14 | 91.361 | .350 | .908 |
| BSD | 55.49 | 58.535 | .817 | .720 |
| CIM | 54.90 | 67.210 | .761 | .752 |
| SAC | 53.65 | 63.753 | .778 | .741 |

**Figure 6** Contribution of Each Item to Overall Reliability Based on Item-Total Statistics

Further analysis indicates that the Cronbach's Alpha value remains above 0.6 even when individual items are removed, confirming the overall reliability of the instrument. The Employee Stress Level in Stock Management (ESL) variable (X1) shows a Corrected Item-Total Correlation of 0.350, with Cronbach's Alpha increasing to 0.908 when the item is deleted, suggesting a relatively smaller yet acceptable contribution to reliability. The Stock Data Transparency (BSD) variable (X2) records a Corrected Item-Total Correlation of 0.817 and a Cronbach's Alpha of 0.720 when removed, indicating a strong contribution. Similarly, Cloud Inventory Management (CIM) (X3) demonstrates a Corrected Item-Total Correlation of 0.761 with Cronbach's Alpha of 0.752, reflecting a strong association with the instrument. Meanwhile, Stock Accuracy (SAC) (Y) shows the highest Corrected Item-Total Correlation at 0.778 and Cronbach's Alpha of 0.741 when deleted, highlighting its substantial role in internal consistency. Overall, all variables meet the reliability threshold, confirming that the instrument is consistent and suitable for measuring the research constructs.

### *4.3 Normality Test*

Based on the One-Sample Kolmogorov–Smirnov normality test, data distribution was evaluated using the significance value (Asymp. Sig.), where values above 0.05 indicate a normal distribution. The results show significance values of 0.696 for Employee Stress Level in Stock Management (ESL) (X1), 0.402 for Stock Data Transparency (BSD) (X2), 0.249 for Cloud Inventory Management (CIM) (X3), and 0.281 for Stock Accuracy (SAC) (Y). Since all values exceed 0.05, the data for all variables are normally distributed. The use of the Kolmogorov–Smirnov test is also appropriate given the sample size of 51 respondents, which falls into the large sample category. Therefore, the dataset meets the normality assumption and allows the use of parametric statistical methods for further analysis of relationships among the research variables (Figure 7).

**One-Sample Kolmogorov-Smirnov Test**

| | | ESL | BSD | CIM | SAC |
|---|---|---|---|---|---|
| N | | 51 | 51 | 51 | 51 |
| Normal Parameters[a,b] | Mean | 15.92 | 18.57 | 19.16 | 20.41 |
| | Std. Deviation | 2.834 | 3.695 | 3.252 | 3.442 |
| Most Extreme Differences | Absolute | .099 | .125 | .143 | .139 |
| | Positive | .097 | .094 | .143 | .091 |
| | Negative | -.099 | -.125 | -.106 | -.139 |
| Kolmogorov-Smirnov Z | | .709 | .894 | 1.020 | .990 |
| Asymp. Sig. (2-tailed) | | .696 | .402 | .249 | .281 |

a. Test distribution is Normal.
b. Calculated from data.

**Figure 7** One-Sample Kolmogorov-Smirnov Test for Normality of ESL, BSD, CIM, and SAC Variables

### *4.4 Linearity Test*

**ANOVA Table**

| | | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|---|
| SAC * ESL | Between Groups | (Combined) | 203.703 | 12 | 16.975 | 1.660 | .116 |
| | | Linearity | 47.168 | 1 | 47.168 | 4.612 | .038 |
| | | Deviation from Linearity | 156.535 | 11 | 14.230 | 1.391 | .217 |
| | Within Groups | | 388.650 | 38 | 10.228 | | |
| | Total | | 592.353 | 50 | | | |

**Figure 8** ANOVA Table for the Effect of Employee Stress Level (ESL) on Stock Accuracy (SAC)

Based on the ANOVA linearity test, the relationship between SAC (Y) and ESL (X1) was evaluated using the significance values for Linearity and Deviation from Linearity. The Sig. value for Linearity is 0.038 (<0.05), indicating that SAC and ESL have a linear relationship. In addition, the Sig. value for Deviation from Linearity is 0.217 (>0.05), showing no significant deviation from linearity. Therefore, the linearity assumption is satisfied, and the regression model is appropriate for further analysis.

**ANOVA Table**

| | | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|---|
| SAC * BSD | Between Groups | (Combined) | 400.036 | 14 | 28.574 | 5.349 | .000 |
| | | Linearity | 366.381 | 1 | 366.381 | 68.583 | .000 |
| | | Deviation from Linearity | 33.655 | 13 | 2.589 | .485 | .919 |
| | Within Groups | | 192.317 | 36 | 5.342 | | |
| | Total | | 592.353 | 50 | | | |

**Figure 9** ANOVA Table for the Effect of Blockchain for Stock Data Transparency (BSD) on Stock Accuracy (SAC)

The linearity test results indicate that the relationship between SAC (Y) and BSD (X2) is linear. The Sig. value for Linearity is 0.000 (<0.05), confirming a significant linear relationship, while the Sig. value for Deviation from Linearity is 0.919 (>0.05), indicating no deviation from linearity. Therefore, the linearity assumption is satisfied, and the regression model is appropriate for further analysis.

**ANOVA Table**

| | | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|---|
| SAC * CIM | Between Groups | (Combined) | 437.304 | 13 | 33.639 | 8.027 | .000 |
| | | Linearity | 352.476 | 1 | 352.476 | 84.113 | .000 |
| | | Deviation from Linearity | 84.828 | 12 | 7.069 | 1.687 | .110 |
| | Within Groups | | 155.049 | 37 | 4.191 | | |
| | Total | | 592.353 | 50 | | | |

**Figure 10** ANOVA Table for the Effect of Cloud-Based Inventory Management (CIM) on Stock Accuracy (SAC)

The linearity test shows that the relationship between SAC (Y) and CIM (X3) is linear, with a Sig. value for Linearity of 0.000 (<0.05). The Sig. value for Deviation from Linearity is 0.110 (>0.05), indicating no significant deviation from linearity. These results confirm that the linearity assumption is satisfied, allowing the regression model to be used for further analysis. Overall, SAC demonstrates a linear relationship with the independent variables.

### *4.5 Multiple Linear Regression Test*

#### *4.5.1 Output Determination Coefficient*

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .833[a] | .695 | .675 | 1.962 |

a. Predictors: (Constant), CIM, ESL, BSD

**Figure 11** Model Summary of Multiple Linear Regression between ESL, BSD, CIM, and SAC

The Adjusted R Square value of 0.675 indicates that the independent variables ESL (X1), BSD (X2), and CIM (X3) collectively explain 67.5% of the variation in Stock Accuracy (SAC). ESL represents employee stress levels in stock management that may influence inventory recording and decision-making accuracy. BSD refers to the implementation of blockchain technology that enhances transparency and reliability of stock data through secure transaction records. Meanwhile, CIM reflects the use of cloud-based inventory systems that enable real-time monitoring and improve operational efficiency. Overall, the regression model accounts for 67.5% of the variation in SAC, while the remaining 32.5% is influenced by other factors not examined in this study.

#### *4.5.2 F-Test Results (Simultaneous Effects)*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 411.402 | 3 | 137.134 | 35.619 | .000[b] |
| | Residual | 180.951 | 47 | 3.850 | | |
| | Total | 592.353 | 50 | | | |

a. Dependent Variable: SAC
b. Predictors: (Constant), CIM, ESL, BSD

**Figure 12** ANOVA Table for the Simultaneous Effect of ESL, BSD, and CIM on Stock Accuracy (SAC)

The ANOVA test results show a significance value (Sig.) of 0.000 (<0.05), indicating that the regression model is valid and the independent variables significantly affect the dependent variable. The variables ESL (X1), BSD (X2), and CIM (X3) simultaneously influence Stock Accuracy (SAC), highlighting the importance of employee stress conditions, data transparency through blockchain, and cloud-based inventory systems in supporting more accurate stock management.

#### *4.5.3 T-Test Results (Hypothesis Testing)*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 4.114 | 2.011 | | 2.046 | .046 |
| | ESL | -.032 | .106 | -.027 | -.305 | .761 |
| | BSD | .453 | .118 | .486 | 3.834 | .000 |
| | CIM | .439 | .129 | .415 | 3.403 | .001 |

a. Dependent Variable: SAC

**Figure 13** Coefficients Table Showing the Partial Effects of ESL, BSD, and CIM on Stock Accuracy (SAC)

The partial test results indicate varying effects of the independent variables on Stock Accuracy (SAC). ESL (X1) shows a significance value of 0.761 (>0.05), indicating that employee stress levels in inventory management do not significantly influence SAC. In contrast, BSD (X2) has a significance value of 0.000 (<0.05), demonstrating that blockchain technology significantly enhances inventory accuracy through improved transparency and reliable recordkeeping. Similarly, CIM (X3) shows a significance value of 0.001 (<0.05), confirming that cloud-based inventory management systems significantly improve SAC by enabling real-time data access and more effective inventory monitoring.

This study applied regression analysis to examine the influence of three factors on Stock Accuracy (SAC). The overall model shows a significant effect, as indicated by the F-test significance value of 0.000 (<0.05), meaning that Employee Stress Level in Stock Management (ESL), Blockchain for Stock Data Transparency (BSD), and Cloud-Based Inventory Management System (CIM) collectively influence SAC. These findings suggest that the combination of psychological and technological factors contributes to explaining variations in stock accuracy. However, the partial analysis using the t-test reveals that not all variables have a significant independent effect, indicating differences in the strength of influence among the examined factors.

Specifically, ESL shows a significance value of 0.761 (>0.05), indicating no significant effect on SAC, which may occur because employees have adapted to work pressure or because automated systems reduce the impact of stress on operational outcomes. In contrast, BSD (Sig. = 0.000) significantly improves stock accuracy by enhancing transparency and reliability of inventory records through blockchain technology. Similarly, CIM (Sig. = 0.001) significantly contributes to SAC by enabling real-time data access and more efficient inventory monitoring. These results highlight that technological implementation, particularly blockchain and cloud systems, plays a more dominant role in improving stock accuracy compared with psychological factors.

## 5. CONCLUSION

Overall, the regression model shows that the combination of three variables—Employee Stress Level (ESL), Blockchain for Stock Data Transparency (BSD), and Cloud-Based Inventory Management System (CIM)—has a significant effect on Stock Accuracy (SAC), as evidenced by the F-test with a significance value of 0.000 (<0.05). However, at the individual level, only BSD and CIM show a significant effect on SAC, while ESL does not, as indicated by a t-test with a significance value of 0.761 (>0.05). These results suggest that the implementation of technology, particularly blockchain and cloud-based inventory management systems, contributes to improving transparency, data integrity, and stock accuracy. Conversely, the impact of employee stress on stock accuracy may be indirect or may be moderated by other factors, such as adaptation to work pressure or the effectiveness of automation systems in reducing human error.

Thus, this study successfully answers the research question by highlighting the important role of technology in improving inventory accuracy, although the influence of psychological factors was not significant in the context of this study. This research contributes to academic discourse by strengthening the theory of the importance of digitalization in supply chain management, particularly in ensuring more accurate and efficient inventory control.

From a practical perspective, the findings suggest that companies should further invest in blockchain technology and cloud-based systems to improve the reliability of inventory records and reduce reliance on error-prone manual interventions. However, this study has certain limitations, such as the exclusion of potential mediating or moderating variables that could explain the indirect relationship between employee stress and inventory accuracy. Future research is encouraged to explore additional factors, such as job satisfaction, employee self-efficacy, or organizational support in managing work-related stress. Furthermore, future studies could further investigate potential challenges in technology implementation, including data security issues and workforce readiness for digital system adoption. More broadly, these findings align with the Industry 4.0 transformation, where the integration of digital technology plays a crucial role in increasing efficiency and transparency in supply chain management. The implications of this study extend beyond the paint manufacturing sector, offering insights applicable to other industries that rely on accurate and efficient stock management.

**Acknowledgements**

With sincere appreciation, I would like to express my deepest gratitude to Dr. Melia Eka Lestiani, S.T., M.T. for her invaluable guidance, constructive feedback, and continuous encouragement throughout this research, which greatly improved its quality and clarity. I also extend my gratitude to Universitas Logistik dan Bisnis Internasional (ULBI), Jalan Sariasih No. 54, Sarijadi, Bandung 40151, Indonesia, for providing a supportive academic environment and facilities that fostered critical thinking and research development. My sincere thanks also go to all employees of PT XYZ, a paint manufacturing company, who voluntarily participated as respondents and generously shared their time and experiences, making this study possible. Finally, I deeply appreciate the support, technical assistance, and encouragement from many individuals during the completion of this research; any remaining shortcomings are entirely my own responsibility.

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