

The Impact of Transformational Leadership and Big Data Analytics Capability on Firm Performance in FMCG Industry

Sahwa Putri Utami^{1*}, Aburizal Maharsyah², Berto Mulia Wibawa³, Syarif Hanoum⁴,
Thedusia Yunita Durman⁵

Institut Teknologi Sepuluh Nopember, Indonesia

Email: utamisahwaputri@gmail.com*

ABSTRACT

This study investigates the impact of transformational leadership (TL) and big data analytics capability (BDAC) on firm performance (FP) in the fast moving consumer goods (FMCG) industry in Indonesia. The research emphasizes the role of BDAC as both a direct determinant of FP and a mediator in the relationship between TL and FP. Data were collected from 118 employees of Paragon Corp using a purposive sampling technique, targeting respondents directly involved in decision making and digital transformation initiatives. Partial Least Squares–Structural Equation Modeling (PLS-SEM) was applied to analyze the data. The results reveal that TL significantly and positively influences FP, both directly and indirectly through BDAC. In addition, BDAC has a significant effect on FP and partially mediates the effect of TL on FP. These findings strengthen the Resource-Based View (RBV) by positioning leadership as a human capital resource and BDAC as a technological capability that together enhance firm competitiveness. Practically, the study provides valuable insights for companies in emerging markets to align leadership and digital analytics in order to achieve sustainable performance.

Keywords: *big data analytics, firm performance, FMCG, strategic management, transformational leadership.*

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INTRODUCTION

The fast moving consumer goods (FMCG) industry is widely recognized as one of the most competitive and dynamic sectors in today's global economy. Companies operating in this industry face constant pressure to respond to market shifts in real time, manage vast volumes of consumer data, and continuously innovate to remain competitive. These challenges underscore the importance of organizational resources that enhance both agility and efficiency. Within this context, big data analytics capability (BDAC) has emerged as a key enabler, allowing firms to process large-scale data, generate valuable insights, and support timely and well-informed decision making. At the same time, organizational adaptability and innovation are strongly influenced by leadership, making transformational leadership (TL) particularly relevant in this sector (Gomes et al., 2021; Kucharska & Rebelo, 2022; Malek & Almari, 2024).

The resource based view (RBV) serves as the theoretical foundation of this study (Barney et al., 2021; Bertram, 2016; Lubis, 2022). RBV posits that organizations can achieve sustained competitive advantage when they possess resources that are valuable, rare, inimitable, and non-substitutable (Baía et al., 2020; Maket & Michael, 2017; Purba et al., 2023). Within this perspective, leadership practices and analytical capabilities are considered intangible strategic resources that contribute to superior performance (S. Z. Khan et al., 2019). TL enables the creation of a compelling vision, inspires employees, and fosters a culture of innovation, while BDAC strengthens the organization's capacity to leverage data strategically.

When combined, these two resources have the potential to mutually reinforce one another in driving organizational outcomes.

Transformational leadership is defined by four core dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Agyemang et al., 2017; Gonfa, 2019; I. U. Khan et al., 2022; Sutanto et al., 2021). Leaders who demonstrate these qualities are able to build trust, articulate a compelling vision, encourage creative problem solving, and provide individualized support to followers (Boies et al., 2015). Empirical evidence has consistently shown that TL fosters innovation, enhances organizational learning, and improves overall performance. In the FMCG sector, where rapid adaptation to shifting consumer demands and intense market competition is crucial, TL is therefore expected to play a particularly vital role (Colicchia et al., 2017; Holloway, 2024; Udokporo et al., 2020).

Alongside this, the growing digitalization of business processes has positioned big data analytics capability as a critical organizational resource (Mikalef et al., 2018; Mikalef & Krogstie, 2020; Pappas et al., 2018). BDAC is defined as the firm's ability to collect, store, process, and analyze large-scale data to support strategic decision making and foster innovation. Prior studies emphasize that BDAC enhances innovation performance, improves operational efficiency, and strengthens market responsiveness[4-6]. Within the FMCG sector, BDAC plays a vital role in identifying consumer trends, optimizing supply chain management, and accelerating product development. Consequently, firms that invest in BDAC are better equipped to sustain competitiveness in highly dynamic markets.

The contributions of transformational leadership and big data analytics capability converge on a single organizational outcome: firm performance. Firm performance (FP) represents not only financial results but also customer satisfaction and operational excellence. Consistent with prior strategic management literature, FP in this study is conceptualized as a second-order construct that integrates financial return, customer perspective, and operational excellence, thus enabling a more holistic assessment of organizational effectiveness. This multidimensional approach provides a more comprehensive assessment of firm performance by capturing financial returns, customer value creation, and internal efficiency.

While both TL and BDAC have been individually associated with firm performance, recent studies suggest that their interaction deserves more attention. TL fosters an organizational culture that encourages technological adoption and continuous learning, thereby enhancing the effectiveness of BDAC. By strengthening the alignment between organizational coordination and the use of big data analytics, TL contributes to more sustainable performance outcomes. In the small- and medium-sized (SME) context, transformational leadership has also been found to accelerate Industry 4.0 adoption, including big data, thereby improving innovation. These strands of evidence point to BDAC as a potential mediating pathway through which TL affects firm performance.

While existing research provides valuable insights, studies focusing on the FMCG sector in Indonesia remain limited, particularly regarding the mediating role of BDAC. Considering the growing reliance of FMCG firms on data-driven strategies, it is crucial to understand how TL and BDAC jointly influence FP. To address this gap, this study has three objectives: to test the direct impact of TL on FP, to assess the direct effect of BDAC on FP, and to examine the mediating role of BDAC in the TL–FP relationship. Accordingly, the following hypotheses are developed: H1 posits that transformational leadership positively

affects firm performance, H2 suggests that big data analytics capability has a positive impact on firm performance, and H3 proposes that big data analytics capability mediates the relationship between transformational leadership and firm performance. Based on the theoretical discussion and hypotheses development, the conceptual framework of this study is presented in Figure 1. The framework illustrates the proposed relationships among transformational leadership (TL), big data analytics capability (BDAC), and firm performance (FP), with BDAC acting as a mediating variable. FP is modeled as a second-order construct comprising financial return (FR), customer perspective (CP), and operational excellence (OE).

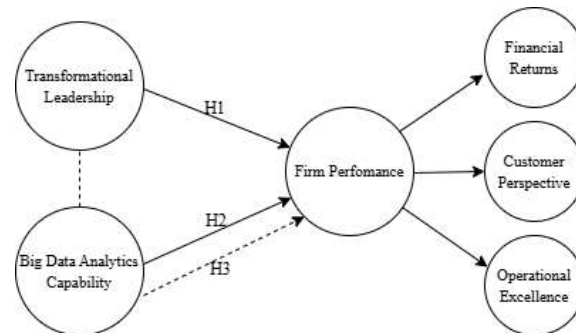


Figure 1 Conceptual Research

METHOD

This study employed a quantitative research approach with a causal design, aiming to examine cause-and-effect relationships among the variables of transformational leadership (TL), big data analytics capability (BDAC), and firm performance (FP) within the FMCG sector. Data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS version 4.1.1.4. The PLS-SEM method was chosen because it is suitable for analyzing complex structural models involving multiple latent constructs and indicators, supports mediation testing, and does not require normally distributed data. Moreover, PLS-SEM is appropriate for studies with small to medium sample sizes.

In this research, data were obtained through an online survey conducted between May 16 and May 30, 2025. The questionnaire was distributed to managers, supervisors, and employees of Paragon Corp, a leading FMCG company in Indonesia. Using a purposive sampling technique, the study targeted respondents with direct knowledge or involvement in decision making and the implementation of TL and BDAC within the organization. In total, 118 valid responses were collected. Several reasons underlie the selection of Paragon Corp as the research site. First, as one of the largest FMCG companies in Indonesia, Paragon provided a highly relevant context for examining TL, BDAC, and FP. Second, the company was recognized for its adoption of data-driven practices and transformational leadership styles that foster innovation. Third, the accessibility of data and organizational support facilitated the implementation of this study.

The respondents represented diverse demographic characteristics that mirrored the workforce composition of FMCG companies. The majority were female (68%), followed by male (31%), with 2% not specifying gender. In terms of age, 58% were between 25 and 34 years old, 32% were under 25, and only 10% were 35 years or older. With respect to tenure,

50% had worked for 1–3 years, 23% for less than one year, and 17% for 4–6 years, indicating that most were still in the early to mid stages of their careers. Regarding organizational position, 78% of respondents were staff, 7% supervisors, 1% managers, and 1% owners, while the remaining 12% occupied other functional roles. This demographic profile suggested that the workforce was predominantly young, early-career employees who tend to be more adaptive to technological change and digital transformation, thereby making them highly relevant for this study.

The questionnaire consisted of approximately 50 items measuring the constructs of TL, BDAC, and FP. All items were rated on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.” TL was measured using four dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. BDAC was measured based on the organizational ability to manage, analyze, and utilize big data for decision making and innovation. FP was conceptualized as a multidimensional construct consisting of financial return, customer perspective, and operational excellence.

RESULTS AND DISCUSSION

This section presents the results of the data analysis and their interpretation in line with the research objectives. The analysis was conducted using SmartPLS 4.1.1.4 and is organized into four main parts: measurement model evaluation (outer model), structural model evaluation (inner model), mediation analysis and goodness of fit, and discussion of findings.

Before examining causal relationships in the structural model, the measurement model was first assessed to ensure that the indicators reliably represent their latent constructs. Convergent validity was evaluated through outer loadings, Cronbach’s alpha, composite reliability (CR) using rho a, and Average variance extracted (AVE).

Table 1 Measurement model

Variable	Indicator	Loading	Cronbach’s A	CR	AVE
TL	TL1	0.788	0.903	0.906	0.723
	TL2	0.855			
	TL3	0.900			
	TL4	0.779			
	TL5	0.920			
BDAC	BDAC1	0.755	0.930	0.936	0.642
	BDAC2	0.835			
	BDAC3	0.790			
	BDAC4	0.863			
	BDAC5	0.862			
	BDAC6	0.783			
	BDAC7	0.728			
	BDAC8	0.830			
	BDAC9	0.753			
FP	FR	0.835	0.937	0.937	0.888
	FR	0.843			
	FR	0.893			

CP	0.866	0.897	0.900	0.830
CP	0.795			
CP	0.842			
OE	0.860	0.905	0.905	0.840
OE	0.835			
OE	0.850			

Table 1 show that all indicators of Transformational Leadership (TL), Big Data Analytics Capability (BDAC), and Firm Performance (FP) had loadings above 0.70, indicating strong contributions to their respective constructs. The highest loading for TL was on the item TL5 (Our organization has leaders who are able to motivate and guide their colleagues) with score 0.920, underscoring the importance of inspiration and guidance in defining TL. The lowest loading was found in BDAC7 (Our system uses artificial intelligence to understand and predict customer needs), but it still exceeded the 0.70 threshold, confirming acceptability. In addition to the indicator loadings, the construct validity was further confirmed by the AVE, all of which exceeded the recommended threshold of 0.50.

This result indicates that the variance explained by each indicator is greater than its error variance, confirming adequate convergent validity and supporting the model’s suitability for further structural testing. The highest AVE value was found in the Financial Return (FR) construct, followed by Operational Excellence (OE) and Customer Perspective (CP), which constitute the dimensions of Firm Performance (FP). These results demonstrate that the second order FP model is supported by valid and reliable dimensions. Furthermore, Cronbach’s Alpha and Composite Reliability values for all constructs were above 0.70, indicating strong internal consistency and confirming that the indicators consistently represent their respective constructs.

Following the confirmation of convergent validity and reliability, discriminant validity was assessed using the Heterotrait Monotrait Ratio (HTMT), which evaluates the extent to which constructs are distinct from one another. As shown in Table 2, all HTMT values were below the threshold of 0.90, indicating that each construct is sufficiently differentiated from the others and that no issue of conceptual multicollinearity exists. These results confirm that the measurement model satisfies the criteria for both statistical and conceptual validity, thereby supporting its suitability for structural model testing. Meanwhile, the discriminant validity of the second-order construct FP and its three dimensions, yielded values slightly above 0.90, suggesting a strong conceptual linkage between FP and its underlying dimensions, as theoretically expected.

Table 2 Discriminant validity

	BDAC	CP	FP	FR	OE	TL
BDAC						
CP	0.666					
FP	0.724	0.990				
FR	0.617	0.810	0.968			
OE	0.753	0.863	0.996	0.831		
TL	0.720	0.798	0.803	0.701	0.757	

After confirming the adequacy of the measurement model, the next stage involved evaluating the structural model (inner model) to test the causal relationships among the latent constructs within the proposed framework. The bootstrapping procedure with 5,000 resamples was applied to estimate the statistical significance of the path coefficients. The structural model was assessed based on several key indicators, including the path coefficients, the coefficient of determination (R^2), effect size (f^2), and the model's overall goodness of fit, represented by the Standardized Root Mean Square Residual (SRMR).

All hypothesized relationships in Table 3 were statistically significant, with *t-statistics* exceeding 1.96 and *p-values* below 0.05. The relationship between TL and FP yielded a path coefficient of 0.509 ($t = 4.607, p < 0.001$), confirming that TL exerts a positive and significant direct effect on organizational performance. This result underscores the importance of transformational leadership in enhancing firm outcomes, particularly in the FMCG industry where adaptability and innovation are critical.

Table 3 Direct effect

	β	t	p	f^2	R^2
TL → FP	0.509	4.607	0.000	0.377	
TL → BDAC	0.669	8.726	0.000	0.812	0.448
BDAC → FP	0.350	3.258	0.001	0.178	0.620
FP → FR	0.915	36.005	0.000	5.135	0.837
FP → CP	0.914	47.088	0.000	5.056	0.835
FP → OE	0.925	58.491	0.000	5.891	0.855

The path from TL to BDAC was also significant, with a coefficient of 0.669 ($t = 8.726, f^2 = 0.812$), suggesting that TL plays a substantial role in shaping an organization's data analytics capability, including its infrastructure, systems, and strategic utilization. Meanwhile, the relationship between BDAC and FP was positive and significant ($\beta = 0.350, t = 3.258, f^2 = 0.178$), indicating that firms with stronger analytics capabilities achieve higher levels of performance through improved innovation, efficiency, and market responsiveness.

Regarding predictive power, BDAC recorded an R^2 value of 0.448, indicating that 44.8% of the variance in BDAC is explained by TL, which reflects the substantial contribution of transformational leadership in developing organizational analytics capability. FP obtained an R^2 of 0.624, meaning that 62.4% of the variance in firm performance is jointly explained by TL and BDAC. These R^2 values represent moderate to strong explanatory power^[10], demonstrating that the combined influence of leadership and analytics capability provides a robust explanation for firm performance in the FMCG context. Furthermore, the second order construct of FP strongly explained its three dimensions FR, CP, and OE with R^2 values above 0.80, indicating excellent internal consistency and structural validity. The findings provide several important insights.

The positive effect of TL on FP supports the argument that visionary and motivational leadership directly contributes to organizational success. This is consistent with RBV^[1], which emphasizes leadership as a strategic intangible resource, and aligns with prior study^[3]. In FMCG companies such as Paragon Corp, where responsiveness and adaptability are essential,

transformational leaders create vision, inspire collective motivation, and cultivate innovation, leading to improved outcomes. The strong relationship between TL and BDAC suggests that leaders play a critical role in fostering analytics capability. Leaders who emphasize innovation and knowledge sharing strengthen the organizational readiness for data-driven decision making. This validates that transformational leadership supports the adoption of Industry 4.0 technologies, including big data^[9]. The significant positive effect of BDAC on FP demonstrates that analytics capability is a crucial driver of competitiveness. This result showing that firms with strong BDAC are better at forecasting demand, optimizing supply chains, and accelerating innovation^[6].

In the FMCG industry, BDAC contributes to superior financial, customer, and operational outcomes. Mediation analysis confirms its role as a partial mediator, showing that TL drives FP both directly and through BDAC. Furthermore, BDAC channels leadership effects toward the three FP dimensions FR, CP, and OE reinforcing the multidimensional nature of performance. Conceptualizing FP as a second order construct thus provides a more holistic view of organizational success^[7]. Theoretically, this study extends the RBV by positioning TL and BDAC as complementary intangible assets that collectively strengthen firm performance. Managerially, the findings suggest that analytics investment must be accompanied by leadership development; without transformational leadership, BDAC's strategic potential remains underutilized.

After examining the direct effects, mediation analysis was conducted to evaluate the indirect relationships among the constructs. The results, as presented in Table 4, show that all mediating paths were statistically significant ($t > 1.96$ and $p < 0.05$). The first set of mediation results revealed that TL indirectly influenced the three dimensions of FP (CP, FR, OE) through the higher order FP construct. For instance, the TL → FP → CP path ($\beta = 0.465$, $t = 4.507$) indicates that higher levels of transformational leadership enhance customer perceptions through overall improvements in firm performance. Similar effects were found for TL → FP → FR and TL → FP → OE, suggesting that TL drives both financial outcomes and operational efficiency via enhanced organizational performance.

The second mediation pathway examined the indirect effects of BDAC on FP dimensions through the higher order FP construct. The paths BDAC → FP → CP, BDAC → FP → FR, and BDAC → FP → OE were all significant ($\beta \approx 0.320$, $t \approx 3.25$, $p < 0.01$), implying that BDAC enhances customer, financial, and operational outcomes indirectly by strengthening overall firm performance rather than through direct effects alone.

Table 4 Indirect effect

	β	t	p	Conclusion
TL → FP → CP	0.465	4.507	0.000	Significant
TL → FP → FR	0.466	4.531	0.000	Significant
TL → FP → OE	0.471	4.508	0.000	Significant
BDAC → FP → CP	0.320	3.265	0.001	Significant
BDAC → FP → FR	0.320	3.231	0.001	Significant
BDAC → FP → OE	0.323	3.271	0.001	Significant
TL → BDAC → FP	0.234	2.838	0.002	Significant
TL → BDAC → FP → CP	0.214	2.834	0.002	Significant

TL → BDAC → FP → FR	0.214	2.817	0.002	Significant
TL → BDAC → FP → OE	0.216	2.835	0.002	Significant

The analysis further revealed a serial mediation effect, wherein TL impacts FP through the sequential influence of BDAC and FP. The indirect pathways (TL → BDAC → FP; TL → BDAC → FP → CP/FR/OE) were all statistically significant ($t \approx 2.8$ and $p < 0.01$), confirming the joint mediating role of BDAC and FP. This result underscores the synergistic interplay between leadership and analytical capability in shaping superior organizational outcomes particularly within data driven industries such as FMCG.

To assess the overall adequacy of the model, the Standardized Root Mean Square Residual (SRMR) was examined as a key goodness-of-fit indicator. The obtained SRMR value of 0.074 falls below the commonly accepted threshold of 0.08, suggesting that the proposed model provides a satisfactory fit to the observed data. The sample mean was 0.054, while the 95% and 99% confidence intervals ranged from 0.066 to 0.072, indicating the model's robustness and stability across resampling. These findings confirm that the structural model adequately represents the relationships among constructs and can be considered both statistically and conceptually sound. Overall, these results confirm the mediating role of BDAC and reinforce the theoretical proposition that leadership and analytics capabilities are mutually reinforcing drivers of firm performance.

The present findings advance current understanding of digital transformation within the FMCG sector by clarifying how transformational leadership and big data analytics capability jointly influence organizational performance. From a theoretical standpoint, this study extends the Resource Based View by demonstrating that leadership and data analytics function as complementary intangible resources that co create value and sustain competitive advantage. From a managerial perspective, the results imply that data analytics initiatives must be strategically guided by transformational leaders who foster a learning culture, encourage experimentation, and translate data insights into action. In rapidly changing FMCG markets, such synergy between human and technological capabilities ensures not only superior financial outcomes but also greater customer satisfaction and operational agility.

CONCLUSION

This study examined the impact of transformational leadership (TL) and big data analytics capability (BDAC) on firm performance (FP) in the FMCG sector, analyzing data from 118 Paragon Corp employees using PLS-SEM. The results revealed that TL directly and positively influences FP by promoting innovation and adaptability, while BDAC also significantly enhances FP through improved decision-making and efficiency. Furthermore, TL positively affects BDAC, which partially mediates the TL–FP relationship, indicating that transformational leaders not only drive performance but also strengthen firms' analytical capabilities to sustain competitiveness. These findings support the Resource Based View by confirming that leadership and analytics are strategic intangible resources that jointly boost firm performance, extending prior research by emphasizing BDAC's mediating role in the FMCG context. For practice, FMCG firms should combine leadership development with analytics investments to foster a data-driven culture aligned with strategic goals. Future research should adopt longitudinal designs to observe evolving dynamics, involve multiple

companies and sub-sectors to enhance generalizability, and explore additional factors such as organizational culture, IT infrastructure, or environmental dynamism as moderators to deepen understanding of how leadership and analytics collectively affect performance.

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