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Fostering Industry 4.0 Readiness: Exploring the Synergy of Transitional Leadership, Dynamic Capabilities, and Organizational Support

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ABSTRACT

This research investigates the realm of Industry 4.0 readiness within the Indonesian automotive manufacturing sector, exploring the intricate interplay between transitional leadership, dynamic capabilities, perceived organizational support, and organizational preparedness for the technological revolution. While the global presence of Industry 4.0 is undeniable, its implementation in Indonesia remains a challenge, prompting the investigation of the synergies between these constructs. The study employs a quantitative approach with cross-sectional data collected through questionnaires, focusing on multilevel positions within the industry. Results support four hypotheses, revealing positive relationships between transitional leadership and dynamic capabilities, transitional leadership and perceived organizational support, perceived organizational support and Industry 4.0 readiness, and dynamic capabilities and Industry 4.0 readiness. However, the correlation between transitional leadership and Industry 4.0 readiness is not substantiated. The study contributes to understanding the pivotal roles of dynamic capabilities and perceived organizational support in Industry 4.0 preparedness, underlining the significance of cohesive leadership and human resource development for successful technological transitions in the manufacturing sector.

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ABSTRAK

Penelitian ini membahas kesiapan Industri 4.0 di sektor manufaktur otomotif Indonesia dengan fokus pada peran kepemimpinan transisi, kapabilitas dinamis, dukungan organisasi yang dirasakan, dan kesiapan Industri 4.0. Meskipun kehadiran Industri 4.0 sudah global, implementasinya di Indonesia masih menantang, yang mendorong perlunya pemahaman lebih mendalam tentang interaksi antara elemen-elemen ini. Metode kuantitatif digunakan dengan data dari berbagai posisi dalam industri. Hasil penelitian mengkonfirmasi hubungan positif antara kepemimpinan transisi dan kapabilitas dinamis, kepemimpinan transisi dan dukungan organisasi yang dirasakan, dukungan organisasi yang dirasakan dan kesiapan Industri 4.0, serta kapabilitas dinamis dan kesiapan Industri 4.0. Namun, tidak ada hubungan signifikan antara kepemimpinan transisi dan kesiapan Industri 4.0. Penelitian ini memberikan wawasan tentang pentingnya kapabilitas dinamis dan dukungan organisasi yang dirasakan dalam mempersiapkan diri untuk Industri 4.0, menekankan perlunya kepemimpinan yang efektif dan pengembangan sumber daya manusia untuk berhasil beradaptasi dengan perubahan teknologi dalam sektor manufaktur.

BACKGROUND

The past decade has witnessed businesses facing escalating disruptions, necessitating quick adaptations to varying demands and substantial cost reductions [1]. The emergence of Industry 4.0, characterized by transformative manufacturing practices, emphasizes agile value chain management [2]. However,

Indonesian automotive companies' Industry 4.0 readiness remains uncharted territory, with organizational strategy and structure being pivotal [3] Notably, while Industry 4.0's global presence is undeniable, its implementation in Indonesia lags behind.



Figure 1 Recent Knowledge Related with Industry 4.0

Figure 1.1 Recent Knowledge Related with Industry 4.0 (Ishardita Pambudi Tama, Ceria Farela Mada Tantrika, Dewi Hardiningtyas Effendi Mohamad, 2021).

Figure 1 highlights that though 93% of Manufacturing firms are aware of Industry 4.0, only 9% have initiated its implementation (Ishardita Pambudi Tama et al., 2021). A survey of Southeast Asian corporate leaders underscored the significance of Industry 4.0's success while revealing that only 48% felt adequately prepared for the transition, echoing Indonesia's situation (McKinsey, 2017). The challenge of Indonesia's limited skilled labor and its intricate relationship with Industry 4.0's potential is acknowledged [4]. Indonesian initiatives such as "Making Indonesia 4.0" outline strategies for Industry 4.0 adoption [5]. Industry 4.0 implementation challenges include financial constraints, organizational resistance, and technology limitations [1]. Transitional leadership emerges as a significant element, offering the potential to facilitate organizational readiness [6].

Transitional leadership, characterized by employee involvement and emotional investment, plays a crucial role in organizational preparedness [7], [8]. Dynamic capabilities, particularly adaptive resource reconfiguration, hold the key to successful Industry 4.0 adaptation[9], [10]. Organizational structure flexibility, encompassing technology, processes, and transformation capabilities, aids Industry 4.0 integration [11]. A fundamental challenge is employees' confidence in navigating Industry 4.0's uncertainty, necessitating supportive leadership and organizational backing [12]. These aspects emphasize the interplay of transitional leadership, dynamic capabilities, perceived organizational support, and Industry 4.0 readiness.

However, gaps remain in understanding the intricate relationships among these elements [13]. While existing research addresses Industry 4.0 adoption and organizational change, comprehensive studies integrating leadership, resource-based views, and digital transformation are lacking, impeding a holistic comprehension of the subject. As such, exploring the synergies and dynamics of these components becomes essential to unlocking a comprehensive understanding of Industry 4.0's readiness and implementation.

The study focuses on the Indonesian automotive manufacturing industry, examining the connections between transitional leadership, dynamic capability, perceived organizational support, and Industry 4.0 readiness. Targeting respondents across organizational levels, the research delves into how these factors interact in this specific context. However, its scope is restricted to the automotive sector, encompassing local, joint venture, and foreign-owned firms, which could limit generalizability. Using cross-sectional data and statistical analysis, the study provides insights into current conditions, though causal relationships may not be established. The study's theoretical value lies in confirming interrelationships, while its practical significance aids automotive stakeholders in understanding these dynamics, identifying influential constructs, and potentially redirecting focus toward non-technological aspects for Industry 4.0 readiness within the industry.

LITERATURE REVIEW

The concept of Transitional Leadership (TL) is explored through antecedents and outcomes. Personality traits influence TL emergence [14], which then impacts perceptions of job quality and individual care [15]. Positive job attitudes encourage extra-role behaviors essential to TL [7], [16]. TL enhances employee performance and commitment, stimulating the willingness to seek new opportunities [7]. TL's outcome of research and learning aligns with the antecedent for Dynamic Capabilities, suggesting a positive relationship between TL and dynamic skills.

Perceived Organizational Support theory emphasizes employees' views on company care and value (Eisenberger et al., 1986; Rhoades & Eisenberger, 2002). TL-driven motivation leads to favorable job conditions, creativity, innovation, and added value, fostering perceived organizational support (Gallo & Hlupic, 2019). The hypothesis of TL's positive effect on perceived organizational support is grounded in these relationships

In the context of Industry 4.0, TL is deemed vital for business survival and growth [17]. TL's development of employee capabilities influences competitiveness, future viability, qualifications, acceptance, and strategy alignment. This study also posits that TL positively influences Readiness for Industry 4.0 based on these discussions.

Industry 4.0, characterized by advancements like cyber-physical systems and the IoT, aims to enhance dynamic capabilities in businesses. This research also highlights a positive relationship between dynamic capability and readiness for Industry 4.0, emphasizing that dynamic capabilities yield competitive advantages and managerial competencies that feed into strategic readiness for Industry 4.0. Next part of this study explores the association between perceived organizational support and readiness for Industry 4.0. The outcomes of perceived organizational support, including reduced strain and increased desire to remain, are identified as antecedents influencing the organizational environment and individuals, thus contributing to Industry 4.0 readiness. The premise of a positive correlation between perceived organizational support and readiness for Industry 4.0 is supported.

RESEARCH METHOD

The research methodology encompasses several key components. The research method involves a quantitative approach with a cross-sectional time horizon. The study's goal is to evaluate correlations among constructs using a deductive approach and primary data collected through questionnaires. The research design encompasses a descriptive, explanatory, and confirmatory approach. The study's research context involves manufacturing industry companies in Indonesia preparing for Industry 4.0, targeting multilevel positions within the firms.

The population and sample selection are carried out using stratified random sampling, dividing the population into relevant groups. Data collection involves self-administered online questionnaires distributed to randomly selected industrial companies in Indonesia. The study's variables include four main constructs: Transitional Leadership (TL), Dynamic Capability (DC), Perceived Organizational Support (POS), and Readiness for Industry 4.0 (RI).

Tabel 1 Construc Variables

Constructs	Dimensions	Observed Variables	Target Respondences	Level
Readiness for Industry 4.0	-	7	281 people working in multilevel positions within several firms operating in manufacturing industry in Indonesia.	Organization level assessed from individual's perception on their respective organizations
Transitional Leadership	Idealized Influence	2	281 people working in multilevel positions within several firms operating in manufacturing industry in Indonesia.	Organization level assessed from individual's perception on their respective organizations
	Intellectual Stimulation	3		
	Inspirational Motivation	3		
	Individualized Consideration	3		
Dynamic Capability	Sensing	5		
	Seizing	4		
	Transforming	5		
Perceived Organizational Support				

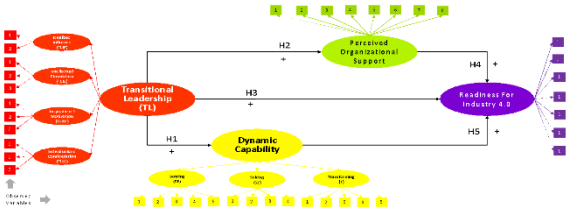
These constructs are broken down into dimensions and observed variables, each measured using Likert scale-based questions. Control variables such as demographic information, position, company ownership, job tenure, and age of the leader are considered

Tabel 2 Control Variable (Demographic)

Variable	Measured Variable
Gender	Male Female
Age	<20 20-29 30-39 40-49 50-59 Above 59
Level of Education	High School/SMK Diploma Bachelor Degree Master Degree Doctoral Degree
Position in the firm	Founder/CEO Directors Top Level Mgt.(EVP/SVP) Middle-Level Mgt. (VP/AVP) Lower-Level Mgt. (SM/M) Staff/Officer/Other
Company Ownership	Local Join Venture PMA
Job Tenure	<1 year 1-2 years 3-5 years 6-8 years 9-10 years >10 years
Age of supervisor	30-40 41-50 51-60 >60

Reliability is assessed using Cronbach's alpha values, and confirmatory factor analysis (CFA) is conducted to evaluate construct validity. The questionnaire development process involves adapting questions from previous studies, translating them, and conducting a pilot test for refinement. Data coding is established for each construct and variable. The data analysis employs structural equation modeling (SEM) through LISREL software, assessing relationships and fit indices for the model.

The overall structural model, which includes all of the variables observed from the various constructs in the theoretical study model, is shown in figure below:



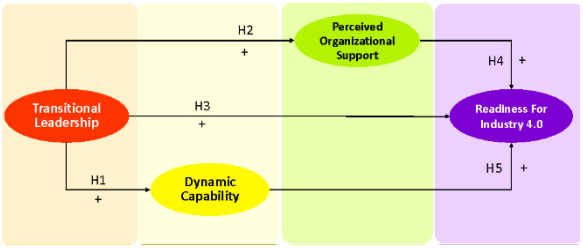
RESULT AND DISCUSSION

This study investigates five hypotheses: (1) the connection between transitional leadership and dynamic capability; (2) the link between transitional leadership and perceived organizational support; (3) the association between transitional leadership and readiness for Industry 4.0; (4) the correlation between perceived organizational support and readiness for Industry 4.0; and (5) the relationship between dynamic capability and readiness for Industry 4.0. The results reveal support for four hypotheses, confirming the positive relationships between transitional leadership and dynamic capability, transitional leadership and perceived organizational support, perceived organizational support and readiness for Industry 4.0, and dynamic capability and readiness for Industry 4.0. However, the third hypothesis, which posits a connection between transitional leadership and readiness for Industry 4.0, is not substantiated as shown below

Hypothesis Relationship	Structural Coefficient	T-Value	Hypothesis Test Result
Transitional leadership has positive relationship with dynamic capability	0.95	18.98	Supported
Transitional leadership has positive relationship with perceived organizational support	0.89	14.99	Supported
Transitional leadership has positive relationship with readiness for Industry 4.0	-0,20	-1,45	Not significant
Perceived organizational support has positive relationship with readiness for Industry 4.0	0.41	3,92	Supported
Dynamic capability has positive relationship with readiness for Industry 4.0	0.74	4.45	Supported

The study investigated the relationships between transitional leadership, dynamic capability, perceived organizational support, and readiness for Industry 4.0 in the manufacturing industry. The results supported several hypotheses:

1. **Transitional Leadership and Dynamic Capability [H1: Supported]** The hypothesis that transitional leadership positively relates to dynamic capability is supported. This leadership type enhances current capabilities and facilitates the development of new capabilities, enabling organizations to thrive during environmental changes.
2. **Transitional Leadership and Perceived Organizational Support [H2: Supported]** The hypothesis that transitional leadership has a positive relationship with perceived organizational support is supported. Transitional leaders create a nurturing environment, coach followers, and inspire higher expectations, resulting in increased support and readiness.
3. **Transitional Leadership and Readiness for Industry 4.0 [H2: Not significant]** The hypothesis that transitional leadership positively relates to readiness for Industry 4.0 is not significantly supported. The complex demands of transitional leader behaviors might not universally motivate all members of an organization for Industry 4.0 readiness.
4. **Perceived Organizational Support and Readiness for Industry 4.0 [H2: Significant]** The hypothesis that perceived organizational support positively relates to readiness for Industry 4.0 is supported. When employees perceive the organization values their contributions, they are more prepared for technological advancements.
5. **Dynamic Capability and Readiness for Industry 4.0 [H2: Significant]** The hypothesis that dynamic capability positively relates to readiness for Industry 4.0 is supported. Dynamic capabilities are crucial for adapting to technological changes and ensuring readiness for Industry 4.0.



Overall, the study contributes the significance of dynamic capabilities and perceived organizational support as key factors in preparing organizations for the challenges of Industry 4.0.

CONCLUSSION

The rise of Industry 4.0 presents a critical juncture for the manufacturing sector, where technological strides promise efficiency gains but demand swift adaptation. In this context, effective leadership, particularly transitional leadership (TL), emerges as a linchpin for organizations, especially within the automotive manufacturing industry, to navigate challenges and gear up for Industry 4.0. By nurturing dynamic capabilities and fostering a conducive environment through TL dimensions like idealized influence, customized consideration, inspirational motivation, and intellectual stimulation, companies can cultivate adaptability. This study underscores the pivotal role of TL in bridging gaps among constructs such as dynamic capability, perceived organizational support, and readiness for Industry 4.0, emphasizing the need to prioritize human resources and cohesive leadership to facilitate successful technological transitions.

REFERENCE

[1] E. de Boer, F. Betti, and Y. Giraud, "Industry's fast-mover advantage: Enterprise value from digital factories," *McKinsey & Company*, Jan. 2020, Accessed: Aug. 18, 2023. [Online]. Available: https://www.mckinsey.com/capabilities/operations/our-insights/industrys-fast-mover-advantage-enterprise-value-from-digital-factories

[2] X. Xu, Y. Lu, B. Vogel-Heuser, and L. Wang, "Industry 4.0 and Industry 5.0—Inception, conception and perception," *Journal of Manufacturing Systems*, vol. 61, pp. 530–535, Oct. 2021, doi: 10.1016/j.jmsy.2021.10.006.

[3] I. P. Tama, C. F. M. Tantrika, D. Hardiningtyas, and E. Mohamad, "Review of Industry 4.0 Strategy and Organization Readiness Level of Automotive SME's in Indonesia," *APMBA*, vol. 009, no. 03, pp. 313–324, Apr. 2021, doi: 10.21776/ub.apmba.2021.009.03.9.

[4] N. T. Antara, *Making Indonesia: transformasi industri manufaktur nasional ke industri 4.0*. Yogyakarta: Penerbit Andi, 2019.

[5] C. H. G. Qing, E. Oktaviani, and S. Heripracoyo, "The Literature Review of Manufacturing Industry 4.0 Using Mapping Design With GIS Approach," in *2019 International Conference on Information Management and Technology (ICIMTech)*, Jakarta/Bali, Indonesia: IEEE, Aug. 2019, pp. 438–443. doi: 10.1109/ICIMTech.2019.8843824.

[6] F. Bushra, A. Usman, and A. Naveed, "Effect of Transformational Leadership on Employees' Job Satisfaction and Organizational Commitment in Banking Sector of Lahore (Pakistan," *International Journal of Business and Social Science*, vol. 2, 2011.

[7] B. M. Bass and B. J. Avolio, *MLQ Multifactor Leadership Questionnaire*. Redwood City: Mind Garden, 2000.

[8] T. C. W. Lin, "Infinite Financial Intermediation," *Wake Forest Law Review*, vol. 50, no. 643, p. Temple University Legal Studies Research Paper No., 2015.

[9] B. Lin, W. Wu, and M. Song, "Industry 4.0: driving factors and impacts on firm's performance: an empirical study on China's manufacturing industry," *Ann Oper Res*, Oct. 2019, doi: 10.1007/s10479-019-03433-6.

[10] K. Kyläheiko and P. Maijanen, "Industry 4.0. Transformation Challenge in Light of Dynamic Capabilities," in *Technical, Economic and Societal Effects of Manufacturing 4.0*, M. Collan and K.-E. Michelsen, Eds., Cham: Springer International Publishing, 2020, pp. 169–189. doi: 10.1007/978-3-030-46103-4_9.

[11] J. Kooistra, "The role of Dynamic Capabilities in the Industry 4.0 transition of manufacturing SMEs.," 2021.

[12] G. A. Irawan, D. Darmawati, and A. I. Anggraeni, "The Role of Perceived Supervisor Support for enhancing Self Efficacy in The Disruption Era (Industry 4.0): Research on Rural Bank BKK Mandiraja Banjarnegara," vol. 5, no. 1, 2019.

[13] A. Waziri, K. Ali, and G. Aliagha, "The Influence of Transformational Leadership Style on ICT Adoption in the Nigerian Construction Industry," *Asian Social Science*, vol. 11, Jun. 2015, doi: 10.5539/ass.v11n18p123.

[14] A. J. Meibaum III, "The Antecedents and Consequences of Transformational Leadership," *LSU Historical Dissertations and Theses*, vol. 5657, 1993, [Online]. Available: https://digitalcommons.lsu.edu/gradschool_disstheses/5657

[15] S. Hentrich, A. Zimber, S. Garbade, S. Gregersen, A. Nienhaus, and F. Petermann, "Relationships Between Transformational Leadership and Health: The Mediating Role of Perceived Job Demands and Occupational Self-Efficacy," *International Journal of Stress Management*, vol. 24, p. 10 1037 0000027, 2016.

[16] S. Jin, M.-G. Seo, and D. Shapiro, "Do happy leaders lead better? Affective and attitudinal antecedents of transformational leadership," *The Leadership Quarterly*, vol. 27, p. 10 1016 2015 09 002, 2015.

[17] A. Hoefer *et al.*, "Management of a COVID-19 outbreak in a Hotel in Tenerife, Spain," *International Journal of Infectious Diseases*, vol. 96, pp. 384–386, 2020, doi: 10.1016/j.ijid.2020.05.047.