The Mediating Role of Organizational Change Capability and Leadership Effectiveness in the Relationship Between Managerial Cognitive Capability and Sustainable Performance

Indra Nur Fauzi[1]*, Erlyn Yuly Astuti[2], Dimas Agung Trisliatanto[3], Albertus Eka Putra Haryanto[4]

[1]*University of Muhammadiyah Surabaya, Surabaya, East Java, Indonesia*
[2]*Regional Economic Development Institute, Surabaya, East Java, Indonesia*
[3]*Universitas Airlangga, Surabaya, East Java, Indonesia*
[4]*Institut Teknologi Sepuluh Nopember, Surabaya, East Java, Indonesia*

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Corresponding Author:
indra.nurfauzi@um-surabaya.ac.id

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ABSTRACT

The organization's presence and social significance are evident in its large membership and the leadership's influence on national policies, including those in Indonesia. Among them is Muhammadiyah, which contributes significantly to the Unitary State of the Republic of Indonesia and plays an important role in many aspects of human life. This study aims to determine how managerial cognitive ability affects sustainable performance in Muhammadiyah Hospitals in Central Java through organizational change capability and effective leadership. The study used 42 Muhammadiyah-owned hospitals in Central Java as the unit of analysis. The interview involved 42 Muhammadiyah hospitals' directors and deputy directors using a total sampling design. The study surveyed and interviewed the 42 hospital directors and deputy directors using KoboToolbox, both online and over the phone. Structural equation modeling (SEM) was used in this study's data analysis with SmartPLS software. The findings indicated that the direct effect of managerial cognitive capability on leadership effectiveness is positive and has the largest coefficient (0.581), with a t-value of 4.538 and a p-value of 0.000. Additionally, regarding sustainable performance, organizational change capability has a stronger indirect effect on managerial cognitive capability, but in the negative direction. In the model of managerial cognitive capability in relation to sustainable performance, organizational change capability has an indirect effect with a coefficient of -0.175, a t-value of 2.000, and a p-value of 0.046.

ABSTRAK

Keberadaan dan signifikansi sosial organisasi ini tercermin dari jumlah anggotanya yang besar serta pengaruh pimpinannya terhadap berbagai kebijakan nasional, termasuk di Indonesia. Salah satunya adalah organisasi Muhammadiyah, yang memberikan kontribusi signifikan bagi Negara Kesatuan Republik Indonesia dan memiliki peran penting dalam berbagai aspek kehidupan manusia. Tujuan penelitian ini adalah untuk mengetahui bagaimana kemampuan kognitif manajerial memengaruhi kinerja berkelanjutan di Rumah Sakit Muhammadiyah di Jawa Tengah melalui kemampuan perubahan organisasi dan kepemimpinan yang efektif. Sebanyak 42 rumah sakit milik Muhammadiyah di Jawa Tengah dijadikan sebagai unit analisis penelitian. Wawancara melibatkan 42 direktur dan wakil direktur Rumah Sakit Muhammadiyah dengan desain total sampling. Sebanyak 42 direktur dan wakil direktur rumah sakit yang menjadi populasi diwawancarai menggunakan KoboToolbox, baik secara daring maupun melalui telepon. Model persamaan struktural (SEM) digunakan dalam analisis data penelitian ini dengan perangkat lunak SmartPLS. Kesimpulan studi ini menunjukkan bahwa pengaruh langsung variabel kapabilitas kognitif manajerial terhadap efektivitas kepemimpinan bersifat positif, dengan nilai koefisien terbesar sebesar 0,581, nilai t sebesar 4,538, dan nilai p sebesar 0,000. Selain itu, untuk kinerja berkelanjutan, variabel kapabilitas perubahan organisasi berpengaruh tidak langsung yang lebih kuat terhadap variabel kapabilitas kognitif manajerial dengan arah negatif. Model kapabilitas kognitif manajerial dalam hubungannya dengan kinerja berkelanjutan menunjukkan adanya pengaruh tidak langsung dari kapabilitas perubahan organisasi, dengan nilai koefisien −0,175, nilai t sebesar 2,000, dan nilai p sebesar 0,046.

1. INTRODUCTION

The primary goal of every organization is to achieve sustained organizational performance. Achieving this performance is challenging and depends on key performance indicators known as objective measures. Sustainability is widely regarded as essential for creating a competitive edge and enhancing an organization's ability to innovate (Bianchi et al., 2022; Esamah et al., 2023). Innovation is among the most important factors for ensuring an organization's sustainability (Nguyen et al., 2018; Ferreira et al., 2020; Inthavong et al., 2023). This innovation encompasses all forms of organizational innovation, including management innovation, as examined in this study (Alabduljader, 2019; Ha et al., 2019). Additionally, it is crucial to understand the elements that can significantly impact an organization's innovation capacity. These elements directly affect management procedures across a company, and current managerial competencies are reflected in management practices (Tarka 2019; Songkajorn et al. 2022; Suwandi et al. 2026).

Managing and maintaining organizational performance is one of the most crucial topics in organizational studies (Ramezan et al., 2013; Sengphet et al., 2019; Widianto et al., 2021). In the performance literature, different authors have offered different definitions of organizational performance (Panjaitan et al., 2022; Zhai et al., 2022; Sari et al., 2023; Shin et al., 2023). Most authors, such as Nikulina and Khomenko (2015), Mutinda and Kilika (2019), and Permatasari et al. (2023), concur that success can be assessed by how well a company uses the fewest possible resources under specific conditions, despite differing definitions. Research indicates that when dramatic change is required, renewing skills such as creativity, learning, and dedication is essential for success (Allen et al., 2013; Afsar et al., 2020; Mladenova, 2022).

The term "sustainable performance" refers to an organization's overall performance across all areas and for all stakeholders, determined by three factors: economic, social, and environmental performance (Shin et al., 2023; Inthavong et al., 2023). According to Partlow et al. (2015) and Talaja et al. (2023), negative emotions such as stress and fear hinder the formation of new knowledge, creativity, and innovative activity, as well as absorptive ability, whereas positive emotions such as joy, trust, and interest are advantageous. This creates a dilemma when a sense of urgency is both necessary and harmful. Organizational leaders and top management recognize that addressing sustainable development issues can enhance their relationships with stakeholders and possibly help them stand out in the marketplace (Ren et al., 2016; Siwiyanti et al., 2022; Yasir et al., 2024).

Fostering sustainable development can be difficult because it requires broad agreement, critical decision-making, and cooperative efforts from all relevant stakeholders (Kraatz & Zajac, 2001; Laamanen & Wallin, 2009; Iqbal & Ahmad, 2021; Islam et al., 2020a). Top-level managers within an organization can play a crucial role among various stakeholders by securing and utilizing necessary resources, developing appropriate strategies, and identifying the most effective means of achieving sustainable development (Iqbal & Ahmad, 2021; Islam et al., 2020b; Karié, 2023). To improve sustainable performance, an organization's capacity to achieve high performance across societal and financial dimensions is strengthened by effective leadership and the ability to instill in employees a sense of responsibility, mutual learning, and norms that foster voluntary environmental behavior (Islam et al., 2021; Kazmi et al., 2025).

Madanchian et al. (2017) and Kumbure et al. (2020) argued that leadership effectiveness is essential for achieving sustainable development because workers act as frontline soldiers, actively contributing to the development and implementation of leaders' ideas and values, which may have a major impact on an organization's performance when they receive positive and fair treatment from their supervisors. Leaders can maintain an organization's competitiveness and relevance in a constantly changing market by implementing effective leadership strategies (Gilley et al., 2009; Siwiyanti et al., 2022). A critical analysis of the current body of research identifies substantial gaps in our knowledge of how leadership effectiveness affects sustainability performance (Naidu, 2020; Huo et al., 2023; Chen et al., 2026).

This provides workers with a way to connect with overarching objectives that support both the company's long-term viability and society's advancement. Ultimately, this benefits people who use a company's goods or services by encouraging cooperation and performance among staff members, groups, and knowledge networks (Eggers and Kaplan, 2009; da Silva and Borsato, 2017). With this organizational infrastructure, a company can quickly adapt and innovate in response to changes in the external environment; streamline work processes; improve the quality of goods, services, and customer experiences; speed up departmental and individual coordination; and facilitate work (de Souza and Forte, 2021; Ererdi, 2020). Its micro-level comprises procedures, routines, tools, workflows, and practices that enable it to achieve its objectives sustainably, scalably, and financially (Chen & Tian, 2022).

Finding and developing opportunities, effectively combining innovations from both internal and

external sources, transferring technology within and between businesses, protecting intellectual property, modernizing business procedures, creating new commercial models, making unbiased decisions, and providing adequate protection against imitation and other forms of rival replication are all necessary for business success (Akkaya et al. 2022; Budiono 2024). These components show how dynamic capabilities develop and build over time and relate to strategic managers' positions within the business by introducing the notion of managerial cognitive capacities (Carter et al., 2012; Adna & Sukoco, 2020). Managers' ability to carry out automatic and controlled mental processes is known as their cognitive capacity, which affects firm performance and strategic changes in business models (Harvey, 2025).

An organization's ability to handle the challenges posed by both internal and external environments is essential for sustainable organizational performance (Tripsas & Gavetti, 2000; Heckmann et al., 2016; Hermano et al., 2022; Mwajambia & Kising'u, 2022). Most of the available research has focused on an organization's internal environment and its relevant aspects, emphasizing the importance of enhancing internal organizational components to boost performance (Heubeck & Meckl, 2021; Pramudita et al., 2025). According to Watad (2018), Schwaeke et al. (2025), and Zhihuang and Yuchen (2025), regulating or influencing external circumstances is beyond an organization's locus of control because they are frequently out of control.

Organizational innovation and efficiency in the use of resources, capabilities, organizational infrastructure, systems, processes, and operations must be prioritized (Hayward, 2021; Sukoco et al., 2022). By achieving these objectives, a business can differentiate itself from its market rivals and foster a cohesive strategy among stakeholders engaged in creativity, shared production, and customer welfare (Hesse et al., 2020). Major civil society organizations, such as Muhammadiyah in Indonesia, have a significant social impact on healthcare, education, and social welfare, as evidenced by their large membership and influence on national policies.

Understanding Muhammadiyah hospitals, particularly value-based healthcare organizations, is a crucial novelty, although expansion through additional branches is the conventional route to growth. In this context, leadership effectiveness is dynamically shaped by both internal and external factors. Examining how leaders manage performance demands while preserving ingrained organizational values offers a unique and highly relevant perspective on strategic organizational development because an organization's success or failure depends on its leadership. The distinctive power and originality of this setting lies in Muhammadiyah hospitals functioning as value-based healthcare institutions, which go beyond straightforward branch expansion.

The efficacy of leadership in these institutions is intrinsically linked to upholding organizational values and health outcomes; therefore, it cannot be evaluated using conventional metrics alone. This study addresses a significant knowledge gap by examining how healthcare organizations achieve sustainable performance without losing their essential identity by coordinating environmental factors with value-based leadership. This study aimed to identify the mediating roles of organizational change capability and leadership effectiveness in the relationship between managerial cognitive capability and sustainable performance in Muhammadiyah Hospitals in Central Java.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

2.1. Definition of Managerial Cognitive Capability

Managerial cognitive capability is the ability of a manager to carry out the mental processes that make up cognition, such as attention, perception, reasoning, and problem-solving (Tripsas & Gavetti, 2000; Armstrong et al., 2012; Mutinda & Kilika, 2019). Sensing, grabbing, and reconfiguring organizational resources and strategies in evolving settings are the micro-foundations of dynamic capabilities (Harvey, 2025). Cognitive abilities serve as the basis for dynamic management when identifying possibilities and reacting to new threats (De Souza et al., 2021). This may involve making significant and occasionally irrevocable investments in both tangible and intangible assets (Eggers and Kaplan, 2009).

The design of business models and the ability to make wise strategic investments are likely to be supported by cognitive talent for problem solving and reasoning (Heubeck & Meckl, 2021). According to Naidu (2020), heterogeneity in long-lasting business models may result from heterogeneity in cognitive capacities for problem solving, which could cause persistent performance disparities among firms. These dynamic talents are probably dependent on managers' social cognitive capacities, as well as their language and communication skills (Nikulina & Khomenko, 2015; Pramudita et al., 2025). Business concepts, including strategic planning, can be structured according to cognitive capacity (Tarka 2019; Ramezan et al. 2013).

Consequently, Helfat and Peteraf (2015) defined managerial cognitive capabilities as the capacity of an individual manager to perform one or more mental activities that constitute cognition. To use this perspective to explain varied performance outcomes, it is necessary to understand the role that managers' cognitive skills play, how they relate to the mechanisms by which capabilities accrue, and how these mechanisms may vary across organizations (Sukoco et al., 2022). Nonetheless, the notion of managerial cognitive capability is unique because it encompasses the capacity to perform both mental and physical tasks.

2.2. Meaning and Components of Organizational Change Capability

Research indicates a strong positive correlation between organizational change capability and business performance. In highly uncertain environments, the relationship between organizational change capability and sustainable performance is reinforced (Faupel and Süß, 2019). According to Ha and Le (2021), this aligns with earlier studies that found a favorable correlation between organizational change capability and organizational success (Ha & Le, 2021). Furthermore, because organizational change capability is the core of higher-order generic dynamic capability, it serves as a higher-order mediator between lower-order capabilities and performance (Carter et al., 2012; Watad et al., 2018). Organizations can only become capable of initiating and implementing change by undergoing it, learning from it, and continuously improving (Fredberg & Pregmark, 2022).

Ferreira et al. (2020) defined organizational change capability as improving performance by implementing continuous change, including changes that occur in parallel or sequentially over time, as well as episodic changes. According to Heckmann et al. (2016), organizational routines help balance stability and change, thereby enhancing an organization's effectiveness. Iqbal and Ahmad (2021) noted that change management routines emerge and become institutionalized, particularly when they are perceived as effective and linked to favorable outcomes. Inthavong et al. (2023) state that the organizational capacity to continuously examine procedures to enhance and revitalize them is referred to as learning.

Organizational change capability refers to an organization's capacity to create and implement appropriate changes to continuously adapt to its environment (Mladenova, 2022). According to Widianto et al. (2021), the three components of organizational change capability—organizational context, change processes, and learning— positively affect organizational performance. The learning dimension outlines long-term organizational capacities to sustain innovation, such as improvements through experience and renewal through experimentation. The organizational context dimension describes the traits that an organization should have in its daily routine to achieve successful change, such as structural flexibility and cultural cohesion. The change process dimension includes organizational concepts that are crucial to demonstrate during a change, such as transformational leadership and incremental deployment (Sukoco et al. 2022; Zhihuang and Yuchen 2025).

2.3. Theory and Dimensions of Leadership Effectiveness

Leadership entails influencing subordinates through various characteristics, actions, and situational flexibility to accomplish an organization's goals (Basu, 2015; Agote et al., 2016). Northouse (2021) identified key theories, including transformational (inspiring vision), contingency (matching style to the situation), behavioral (learned actions), and trait (innate attributes) theories. Key aspects include vision setting, emotional intelligence, empowerment, and flexibility (Lee & Hong, 2020). Possessing leadership traits alone is insufficient for successful leadership (Malik, 2024).

According to this paradigm, a leader's effectiveness is determined by how well they adapt to their circumstances (Gilley et al., 2009; Chakraborty, 2023). In addition to the company's culture, the types of difficulties encountered and the leader's personal qualities can affect their effectiveness (Ererdi, 2020). Systems thinking and complexity theory are the cornerstones of adaptive leadership (Esamah et al., 2023). Systems thinking highlights the interdependence of organizational components and the importance of understanding the broader context in which decisions are made (Ha et al., 2019). Malik (2024) notes that these theoretical stances emphasize the significance of adaptability, learning, and flexibility in effective leadership.

According to Easton (2022), the most significant (essential) situational elements that impact leadership effectiveness can be identified in three dimensions: (1) leader-member relations: the leader will have more power and influence if he/she can build positive relationships with his/her members, which means that he/she is liked, respected, and trusted; (2) task structure: assignments that are well-structured,

explicit, clear, and programmed will allow the leader to be more influential than if they are vague, unclear, and unstructured; and (3) position of power: the leader will have more power and influence if his/her position allows him to reward, punish, appoint, and fire members.

2.4. Theory of Sustainable Performance Aspects and Objectives

Sustainable performance within a given timeframe with respect to predetermined criteria is referred to as organizational growth (Kraatz & Zajac, 2001). da Silva and Borsato (2017) stated that organizational development is the evaluation of sustainable performance, which refers to a method or system for implementing organizational job competence based on specific criteria. Performance evaluation includes tasks that measure different organizational operations and produce feedback to enhance the organization (Chen et al., 2026). Planning, processing, and evaluation are the three aspects of sustainable performance. Consequently, the focus has been on improving sustainability performance (Alghfeli et al., 2024).

Environmental, social, and economic performance are all parts of an organization's sustainable performance (Chen et al., 2026). It also concerns an organization's ability to sustain a long-term competitive edge by reducing harmful emissions and enhancing its green innovation capabilities (Islam et al., 2020b; Permatasari et al., 2023). Sustainable performance is crucial for businesses because it sets them apart from their rivals and is equally important for individuals because it ensures that workers are ethically motivated to achieve the firm's objectives (Mwajambia & Kising'u, 2022; Kazmi et al., 2025).

According to Amiri (2020), the main goals of sustainable performance initiatives are to (1) increase the effectiveness of an organization as an open system, (2) develop the hidden potential of organizational members into actual operational capabilities, and (3) implement behavioral interventions through management and organizational members working together to find better ways to accomplish both individual and organizational goals. Future difficulties, education levels, technology, economic systems, social tendencies, and rivalry are factors that drive such changes (Ren et al., 2024).

2.5. Hypothesis Development

2.5.1. The Effect of Managerial Cognitive Capability on Organizational Change Capability

Grounded in the dynamic managerial capabilities framework (Adner & Helfat, 2003; Helfat & Peteraf, 2015), managerial cognitive capability is the foundational antecedent of strategic adaptation. Rather than operating in a vacuum, a manager's analytical and perceptual capacity enables structured sensemaking, allowing leaders to interpret volatile environmental signals and systematically evaluate organizational conditions (Mutinda & Kilika, 2019). This heightened cognitive architecture directly fuels strategic problem-solving capacity; cognitively adept managers are better equipped to diagnose complex operational bottlenecks and formulate proactive and high-caliber strategic responses rather than reactive adjustments (Heyden et al., 2017).

However, individual cognitive capacity alone is insufficient to drive firm outcomes. As Levine et al. (2017) emphasized, cognitive insight must be operationalized through social and managerial oversight, specifically by orchestrating, planning, and maximizing collective team dynamics. Adna and Sukoco (2020) clarify this micro-to-macro transition, demonstrating that the impact of managerial cognitive abilities on firm performance is indirect and mediated by organizational capacity for change (OCC). Cognition provides an analytical blueprint and strategic intent; however, performance advantages materialize only when cognitive capital is translated into structural routines, flexible resource allocation, and team-level responsiveness, which define an organization's dynamic capability for change. Based on previous research, the first hypothesis is as follows:

H1. Managerial cognitive capability affects organizational change capability in Muhammadiyah Hospitals in Central Java

2.5.2. The Effect of Managerial Cognitive Capability on Leadership Effectiveness

In dynamic business environments, effective management depends heavily on the interplay between individual cognitive architectures and organizational routines. Managers must manage high cognitive loads, which require intense focus, working memory, and advanced problem-solving (Budiono, 2024). These micro-foundations of cognition serve as the underlying engines for macro-level dynamic capabilities (Adna & Sukoco, 2020; Helfat & Peteraf, 2015).

Specifically, a manager's cognitive capacity determines the effectiveness of sensing (filtering environmental signals), which directly fuels seizing (evaluating and committing to strategic opportunities) and ultimately enables reconfiguring (orchestrating and aligning organizational resources to match

external shifts). Thus, organizational adaptability is fundamentally bounded and driven by cognitive and managerial processes. Based on previous research, our second hypothesis is as follows:
H2. Managerial cognitive capability has effects on leadership effectiveness in Muhammadiyah Hospitals at Central Java

2.5.3. The Effect of Managerial Cognitive Capability on Sustainable Performance

At the micro-foundational level, managerial cognitive capacities, including perception, reasoning, and attention, serve as psychological mechanisms that enable dynamic capabilities (Helfat & Peteraf, 2015; Kumbure et al., 2020). By underpinning the core dynamic routines of *sensing* environmental shifts, *seizing* opportunities, and *reconfiguring* organizational resources, individual-level cognitive abilities determine how effectively leadership navigates turbulent environments and executes strategic realignments (Cao et al., 2020; Kumbure et al., 2020).

However, translating individual cognitive drivers into macro-level organizational performance requires an understanding of the potential boundary conditions. Empirical evidence indicates that while organizational capacity for change directly drives performance, this relationship is not significantly moderated by social capital (Adna & Sukoco, 2020). This lack of moderation suggests that the power of dynamic change capabilities rests primarily on internal cognitive processes and formal structural adaptation rather than relational or informal network assets.

Consequently, managerial cognitive ability emerges as a primary antecedent in the strategic change process, bridging the gap between micro- and macro-level firm adaptability. Based on previous research, the third hypothesis is as follows:
H3. Managerial cognitive capability affects sustainable performance in Muhammadiyah Hospitals in Central Java

2.5.4. The Effect of Organizational Change Capability on Sustainable Performance

Within the dynamic resource-based view (DRBV), organizational sustainability performance depends on both macro-level dynamic capabilities and micro-level behavioral drivers. At the structural level, organizational capabilities—specifically, customer integration, value chain flexibility, and strategic flexibility—provide the adaptable architecture needed to reconfigure resources toward sustainable goals (Gelhard & von Delft, 2016). However, these structural capabilities require micro-level catalysts to be fully realized. As Kazmi et al. (2025) and Ha and Le (2021) demonstrated, raising environmental awareness and empowering individual workers transforms employees into change agents.

This empowerment fosters pro-environmental attitudes and behaviors, bridging the gap between strategic capacity and organizational actions. Consequently, when flexible dynamic capabilities are aligned with empowered, environmentally conscious change agents, organizations are better positioned to adopt eco-friendly innovations, enhance their operational productivity, and achieve superior environmental and societal performance. Based on previous research, the fourth hypothesis is as follows:
H4. Organizational change capability affects sustainable performance in Muhammadiyah Hospitals in Central Java

2.5.5. The Effect of Leadership Effectiveness on Sustainable Performance

Contingency and situational leadership frameworks share the view that leadership effectiveness is inherently context-dependent, achieving optimal outcomes in environments characterized by heightened uncertainty and dynamic change, where conventional management routines are inadequate (Ererdi, 2020). Rather than operating in a vacuum, a leader's capacity to guide an organization is continuously shaped by the interaction between internal organizational capabilities and external environmental pressures (Chen et al., 2026). Within this interplay, specific leadership traits, behaviors, and styles serve as foundational determinants of effectiveness, directly dictating whether an enterprise succeeds or fails (Madanchian et al., 2017).

When leadership roles are strategically aligned with overarching institutional objectives, leadership effectiveness becomes a key driver of sustainable performance and long-term vitality (Siwiyanti et al. 2022; Yasir et al. 2016). In the context of organizational development, such as structural expansion and branch creation within Muhammadiyah, effective leadership serves as an adaptive response to complex environmental challenges and transforms contextual pressure into institutional growth. Based on previous research, the fifth hypothesis is as follows:
H5. Leadership effectiveness affects sustainable performance in Muhammadiyah Hospitals in Central Java

2.5.6. Organizational Change Capability Mediates the Effect of Managerial Cognitive Capability on Sustainable Performance

According to the Dynamic Capabilities Theory, a hospital's organizational performance is heavily contingent on its structural and operational adaptability. Specifically, managerial cognitive sensing capacities—the micro-foundations through which leaders perceive environmental shifts—do not directly lead to superior performance; instead, a hospital's organizational capacity for change (OCC) mediates this relationship (Widianto et al., 2021). Middle managers play a vital bridging role in this dynamic: by systematically gathering data and validating facts, they enhance sound strategic decision-making (Sukoco et al., 2022), and their competence and self-assurance cultivate employee trust, which is needed to minimize resistance to change (Heyden et al., 2017).

Consequently, an established OCC translates these managerial insights into performance gains by fostering an ecosystem characterized by open communication, structured organizational creativity (Zhihuang & Yuchen, 2025), and continuous innovation adoption (Shin et al., 2023). Based on previous research, the sixth hypothesis is as follows:

H6. Managerial cognitive capability affects sustainable performance in Muhammadiyah Hospitals in Central Java, mediated by organizational change capability

2.5.7. Leadership Effectiveness Mediates the Effect of Managerial Cognitive Capability on Sustainable Performance

Underpinned by the Upper Echelons Theory and Cognitive Leadership frameworks, the transformation of supportive leadership into green building adoption depends on distinct yet interconnected cognitive and managerial mechanisms. Although general managerial cognitive capability alone may not directly mediate this relationship, suggesting that broader administrative competence serves as an underlying contextual enabler rather than a direct psychological trigger for green practices (Naidu, 2020), domain-specific cognition plays a decisive role in this relationship.

Supportive leadership actively cultivates sustainability-oriented cognition, which serves as the primary proximal mediator that translates supportive leadership into tangible eco-friendly behaviors (Siwiyanti et al., 2022; Waqar et al., 2026). Furthermore, the overall indirect effect highlights a dual-processing mechanism: leadership provides organizational safety and strategic intent, whereas the confluence of general managerial capacity and targeted sustainability cognition equips managers with the structural aptitude and normative motivation required to achieve complex sustainable outcomes (Bianchi et al., 2022).

Consequently, as demonstrated by Waqar et al. (2026), supportive leadership influences green building adoption through both direct behavioral push and indirect cognitive realignment, emphasizing that sustainable transformation requires both the capability to manage and specific cognitive framing to prioritize eco-friendly innovation. Based on previous research, the seventh hypothesis is as follows:

H7. Managerial cognitive capability affects sustainable performance in Muhammadiyah Hospitals in Central Java, mediated by leadership effectiveness

3. RESEARCH METHOD

This type of research, referred to as quantitative explanatory research, aims to elucidate the causal relationship between managerial cognitive capabilities (X) and sustainability performance (Y). The mediating variables, Z1 and Z2, are organizational change capability and leadership effectiveness, respectively. The conceptual framework in Figure 1 shows the relationships between the variables using a two-tailed test.

This study used quantitative data derived from primary sources. Primary data were collected through interviews with selected respondents and standardized questionnaires (Hair Jr. et al., 2021). The unit of analysis comprised 42 Muhammadiyah-owned hospitals operating in Central Java. Forty-two directors and deputy directors of Muhammadiyah Hospitals participated in the interviews. For the study population, 42 hospital directors and deputy directors were surveyed and interviewed over the phone and online using KoboToolbox, employing a total sampling design.

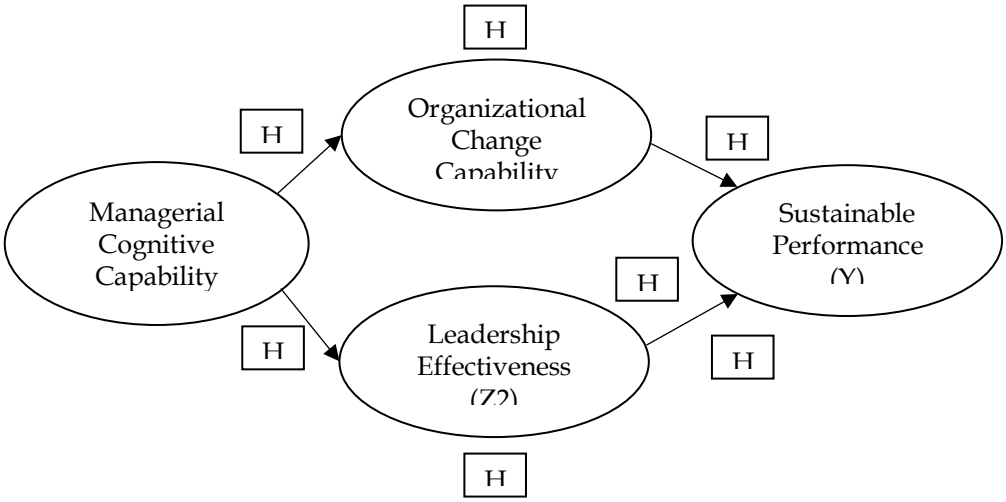


Figure 1. Conceptual Framework

Table 1. Measurement Variable Indicators

Variable	Code Item	Indicator	Scale
Managerial Cognitive Capability (X1)	X.1	I identify new opportunities for the hospital to grow	Likert
	X.2	I conceptualize new ways of working	
	X.3	I actively develop new ways of working	
	X.4	I actively develop comprehensive knowledge related to the job	
	X.5	I actively adjust the work direction of employees	
	X.6	I use existing resources at the hospital for new job/business opportunities at the hospital	
Sustainable Performance (Y)	Y.1	The organization's growth rate of patients and health service users is acceptable to the owner (Muhammadiyah)	Likert
	Y.2	The group improves Muhammadiyah's standing in society	
	Y.3	The group promotes Muhammadiyah's social empowerment	
	Y.4	The organization makes effective use of land, space, and location for hospital operations	
Organizational Change Capability (Z1)	Z1.1	I am aware of how to evaluate the root causes of issues arising from organizational change	Likert
	Z1.2	The organization's leader has successfully communicated the information flow	
	Z1.3	Workers are aware of how the modifications will improve the performance of the company as a whole	
Leadership Effectiveness (Z2)	Z2.1	I think the leader does a wonderful job	Likert
	Z2.2	I believe that certain managers are ineffective when it comes to teamwork	
	Z2.3	Some managers, in my opinion, have been successful in accomplishing a variety of organizational goals during their tenure	
	Z2.4	I believe that some managers will succeed in reaching different organizational goals in the future	

Total sampling is a technique in which the entire population serves as the sample. This technique has been used to generate generalizations with a small margin of error (Hari Jr. et al., 2021). In this study, the values and beliefs of Muhammadiyah Hospital in Central Java served as operational definitions of managerial cognitive capability, sustainable performance, organizational change capability, and leadership effectiveness. These values and beliefs inspire and encourage stakeholders. The indicators used to explain and measure all variables are listed in Table 1.

To make the research data easier to understand and analyze, this study used descriptive statistics. Organizational performance was the dependent variable, organizational change capability and leadership effectiveness were the mediating variables, and managerial cognitive capability was the independent variable. Structural equation modeling (SEM) was employed in this study's data analysis using SmartPLS software. Researchers can use SEM to test the hypothesis that there is a relationship between observable variables and underlying latent constructs.

SmartPLS is a statistical tool used for latent variable analysis. The analyses it supports include exploratory factor analysis, confirmatory factor analysis, latent class analysis, latent growth curve modeling, and structural equation modeling. The program can handle combinations of continuous and categorical variables and often accepts missing data. This application allows different investigations to be integrated into a single framework that can use techniques such as growth curve modeling and latent class analyses.

4. DATA ANALYSIS AND DISCUSSION

4.1. Common Method Bias Assessment

Because this study employs partial least squares structural equation modeling (PLS-SEM) in SmartPLS, common method bias should be evaluated using complementary statistical procedures. Standardized questionnaires and structured data collection using the KoboToolbox ensured consistent administration of the research instrument. Nevertheless, these procedures alone cannot eliminate potential bias from single-source measurements, social desirability, or respondents' tendencies to provide consistent answers across conceptually related constructs. To statistically evaluate the potential common method bias, Harman's single-factor test was conducted by entering all 17 measurement indicators into an unrotated exploratory factor analysis.

The proportion of variance explained by the first extracted factor should be examined to determine whether a dominant general factor accounts for a substantial share of the observed variance (Kock, 2015). A first-factor variance below the commonly applied 50% threshold would provide preliminary evidence against a dominant single-method factor, although this test should not be considered conclusive. This procedure involves examining the variance inflation factor (VIF) values for all latent constructs, including managerial cognitive capability, sustainable performance, organizational change capability, and leadership effectiveness. Full collinearity VIF values below the recommended threshold of 3.3 would indicate that substantial common method bias was not detected under this diagnostic approach.

The combined use of these statistical procedures would provide a more comprehensive assessment of potential method-related variance. However, because all research constructs were measured using perceptual data collected from the same respondent group, residual common method bias should be acknowledged when interpreting structural relationships and mediation effects. Accordingly, the findings should be interpreted as relationships among managerial perceptions rather than definitive causal effects established through independently measured organizational outcomes. Table 2 is included in the Results section after the statistical calculations were completed.

Table 2. Common Method Bias Assessment

Assessment Method	Statistical Indicator	Criterion	Empirical Result
Harman's single-factor test	Variance explained by first factor	Below 50%	To be calculated
Full collinearity – X1	VIF	Below 3.3	To be calculated
Full collinearity – Y	VIF	Below 3.3	To be calculated
Full collinearity – Z1	VIF	Below 3.3	To be calculated
Full collinearity – Z2	VIF	Below 3.3	To be calculated

Three considerations could enhance the methodological rigor of this study.

First, the measurement indicators were reverse-coded. The Leadership Effectiveness indicator Z2.2 is negatively worded as follows:

"I believe that certain managers are ineffective when it comes to teamwork." This indicator was reverse-

coded before calculating the construct scores, provided that the intended theoretical direction was aligned with the remaining leadership indicators. Its wording should also be examined for potential measurement-related artifacts.

Second, the sample size and number of units analyzed were small. Although 42 hospitals constituted the defined population, the manuscript should clarify whether each hospital contributed exactly one respondent or whether some hospitals were represented by multiple directors or deputy directors. This distinction is important for establishing the independence of observations. Third, sustainable performance measurement can incorporate objective indicators, such as patient growth, financial sustainability, service quality, operational efficiency, and independently documented organizational outcomes.

4.2. Respondent Demography Profile

Forty-two respondents participated in data collection. The demographic profiles of the respondents, including their gender distribution, are presented in Table 3.

Table 3. Respondent Disaggregated by Demographics

Profile	Frequency (N)	Percentage (%)
Gender:		
Male	23	54.8%
Female	19	45.2%
Age:		
31–40 years	22	52.4%
41–50 years	11	26.2%
> 50 years	9	21.4%
Work Period:		
< 5 years	12	28.6%
5–10 years	19	45.2%
11–15 years	5	11.9%
> 15 years	6	14.3%

Table 3 shows that most respondents in director or deputy director positions were male. However, 45.2% of the directors or deputy directors at Muhammadiyah Hospital in Central Java were women. This also indicates gender equality in Muhammadiyah Hospital's management in Central Java. In terms of age, most respondents, who were directors or deputies, were aged between 31 and 40 years (52.4%).

This demographic trend suggests that Muhammadiyah hospitals may need to accelerate their leadership regeneration efforts to attract younger talent and increase their representation of younger age groups in their leadership roles. Work experience is also a key factor in appointing directors to Muhammadiyah-managed hospitals in Central Java. This is evident in the fact that 45.2% of the respondents had between 5 and 10 years of service, while 14.3% had more than 15 years of service.

4.3. Validity Testing and Reliability Checking

Confirmatory factor analysis (CFA) was used to assess the validity of each variable. An indicator was considered valid if its p-value was lower than the specified significance level (α). Each latent variable was tested to determine whether its indicators contributed significantly to its formation of the latent variable. Specifically, an indicator was deemed valid if its p-value was less than $\alpha = 0.05$. The detailed results for each indicator are presented in Table 4.

Table 4 shows that the factor loadings for each indicator of every variable were greater than 0.70, with a p-value of 0.00. This indicates that the indicators for each variable were valid and significant. Based on the highest factor loadings for each indicator of every variable, the indicator "This group promotes the social empowerment of Muhammadiyah" makes the greatest contribution to explaining the sustainable performance variable.

Table 4. Validity Testing for Each Dimention and Variable

Variable	Indicator	Loading Factor	p-value
Managerial Cognitive Capability (X)	X.1	0.845	0.00
	X.2	0.888	0.00
	X.3	0.892	0.00
	X.4	0.873	0.00
	X.5	**0.894**	0.00
	X.6	0.876	0.00
Sustainable Performance (Y)	Y.1	0.860	0.00
	Y.2	0.865	0.00
	Y.3	**0.940**	0.00
	Y.4	0.890	0.00
Organizational Change Capability (Z1)	**Z1.1**	**0.893**	0.00
	Z1.2	0.852	0.00
	Z1.3	0.825	0.00
Leadership Effectiveness (Z2)	Z2.1	0.865	0.00
	Z2.2	0.844	0.00
	Z2.3	**0.879**	0.00
	Z2.4	0.731	0.00

To assess the reliability of a variable, the results of the Cronbach's alpha calculation were examined. A variable is considered reliable if the Cronbach's alpha value is greater than 0.7 (Hair Jr et al., 2021). Table 5 presents the Cronbach's alpha values for each variable.

Table 5. Reliability Checking for Each Variable

Variable	Cronbach's Alpha
Managerial Cognitive Capability (X)	0.941
Sustainable Performance (Y)	0.911
Organizational Change Capability (Z1)	0.820
Leadership Effectiveness (Z2)	0.854

Table 5 shows that variables X, Y, Z1, and Z2 had Cronbach's alpha values greater than 0.70. This indicates that the variables used in this study were reliable. Furthermore, based on the validity test results, the items comprising the variables in this study were valid and reliable. The AVE values were calculated from the illustrative outer loadings in Table 6.

Table 6. Average Variance Extracted (AVE)

Construct of Variable	AVE	Threshold	Interpretation
Managerial Cognitive Capability (X)	0.707	≥ 0.500	Meets criterion
Organizational Change Capability (Z1)	0.710	≥ 0.500	Meets criterion
Leadership Effectiveness (Z2)	0.702	≥ 0.500	Meets criterion
Sustainable Performance (Y)	0.719	≥ 0.500	Meets criterion

According to Table 6, the AVE values ranged from 0.702 to 0.719. Accordingly, all four constructs met the recommended minimum AVE threshold, supporting the convergent validity of the simulated measurement model. The Heterotrait–Monotrait Ratio of Correlations (HTMT) was used to assess whether the two reflective constructs were sufficiently distinct. The recommended decision criteria were as follows: (1) HTMT below 0.85: a conservative criterion for discriminant validity; (2) HTMT below 0.90: a commonly accepted criterion when constructs are conceptually related; and (3) Bootstrapped HTMT confidence interval: its upper bound should be below the selected threshold for a stronger inferential assessment.

Table 7. HTMT Matrix

Construct of Variable	X	Z1	Z2	Y
Managerial Cognitive Capability (X)				
Organizational Change Capability (Z1)	0.681			
Leadership Effectiveness (Z2)	0.724	0.703		
Sustainable Performance (Y)	0.548	0.637	0.592	

Table 7 shows an HTMT value of 0.724 between Managerial Cognitive Capability and Leadership Effectiveness, which remains below the conservative threshold of 0.85. Consequently, the hypothetical HTMT results were consistent with satisfactory discriminant validity. In the actual study, SmartPLS bootstrapping was used to examine the confidence intervals rather than relying exclusively on point estimates. Although the HTMT is preferred, the Fornell–Larcker criterion can provide supplementary evidence. The square root of each construct's AVE should exceed its correlation with the other constructs, as shown in Table 8.

Table 8. Fornell–Larcker Matrix

Construct of Variable	X	Z1	Z2	Y
Managerial Cognitive Capability (X)	**0.841**			
Organizational Change Capability (Z1)	0.590	**0.843**		
Leadership Effectiveness (Z2)	0.620	0.605	**0.838**	
Sustainable Performance (Y)	0.470	0.550	0.510	**0.848**

Table 8 shows that each diagonal value exceeded the corresponding inter-construct correlations, indicating the fulfillment of discriminant validity according to the Fornell–Larcker criterion. The Fornell–Larcker assessment also indicated that the square root of the AVE for each construct exceeded its correlation with the other constructs. Collectively, these results demonstrate how convergent and discriminant validity were reported for the proposed measurement model.

4.4. Analysis of Structural Equation Modeling

Following the validity and reliability tests conducted on each item comprising the variables used in the study, the next step was to perform an analysis using structural equation modeling (SEM). Referring to the research framework illustrated in Figure 1, the results of the structural equation modeling analysis with a two-tailed test are as follows:

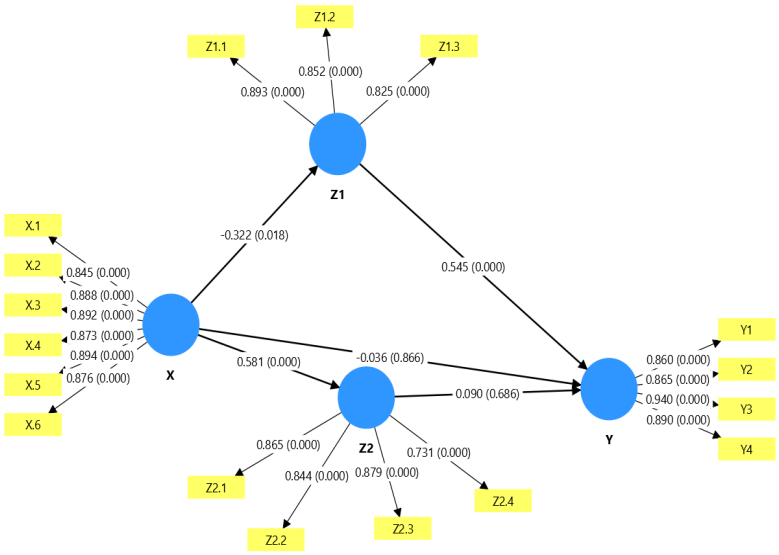


Figure 2. Structural Equation Modeling Result

As shown in Figure 2, models were derived for the direct and indirect effects of each research pathway (Table 9).

Table 9. Coefficient for Direct and Indirect Effects

Hypothesis	Coefficient
Direct Effect	
H1: X → Z1	-0.322
H2: X → Z2	0.581
H3: X → Y	-0.036
H4 Z1 → Y	0.545
H5: Z2 → Y	0.090
Indirect Effect	
H_6: X → Z1 → Y	-0.175
H_7: X → Z2 → Y	0.052

The coefficients in Table 9 indicate that the largest effect is the positive direct effect of managerial cognitive capability (X) on leadership effectiveness (Z2). Table 6 also shows that organizational change capability (Z1) has a stronger indirect effect on managerial cognitive capability (X) than on sustainable performance (Y), with a negative coefficient. The indirect influence of organizational change capability (Z1) on the model of managerial cognitive capability (X) in relation to sustainable performance (Y) was -0.175.

4.5. Hypothesis Testing Result

Hypothesis testing for each path model was conducted by examining the t-test statistic and p-value for each hypothesis, as shown in the path diagram in Figure 2 here). Using a significance level ($\alpha = 0.05$), if the t-test statistic was greater than 2.02, and the p-value was less than the significance level ($\alpha = 0.05$), it could be concluded that each research hypothesis provided a significant effect for both direct and indirect effects. Table 10 presents the test results for each hypothesis.

Table 10. Hypothesis Testing

Hypothesis	t-value	p-value
Direct Effect		
H1: X → Z1	2.372	0.018
H2: X → Z2	4.538	0.000
H3: X → Y	0.168	0.866
H4: Z1 → Y	4.167	0.000
H5: Z2 → Y	0.405	0.686
Indirect Effect		
H6: X → Z1 → Y	2.000	0.046
H7: X → Z2 → Y	0.393	0.695

Based on the t-statistics and p-values in Table 10, the findings indicate that managerial cognitive capability (X) significantly influences both organizational change capability (Z1) and leadership effectiveness (Z2). Furthermore, organizational change capability (Z1) has a significant direct effect on sustainable performance (Y), as shown by t-values exceeding the critical threshold of 2.02 and p-values less than 0.05. Conversely, the direct relationships between managerial cognitive capability (X) and sustainable performance (Y) and between leadership effectiveness (Z2) and sustainable performance (Y) were statistically insignificant, with t-values below 2.02 and p-values above 0.05.

Particular attention should be paid to relationships with negative path coefficients. A negative coefficient indicates an inverse relationship between the predictor and outcome variables, implying that an increase in one variable is associated with a decrease in the other variable, holding the other predictors constant. However, when the corresponding relationship is statistically insignificant, the negative coefficient should not be interpreted as evidence of an adverse effect. This indicated that the observed negative association lacked sufficient statistical support.

From a theoretical perspective, a negative coefficient may reflect organizational complexities,

contextual constraints, competing managerial priorities, or inconsistencies between leadership practices and sustainability objectives. However, these explanations remain unclear and require further investigation. In the mediation analysis, organizational change capability (Z1) significantly mediates the relationship between managerial cognitive capability (X) and sustainable performance (Y).

This suggests that managerial cognitive capability contributes to sustainable performance primarily by facilitating organizational adaptation and transformation rather than through a direct statistically significant pathway. In contrast, leadership effectiveness (Z2) did not show a statistically significant mediating effect, indicating that the proposed indirect pathway through leadership effectiveness was not supported. Overall, these findings underscore the importance of organizational change capability as a mechanism linking managerial cognitive capability and sustainable performance.

4.6. Goodness of Fit for Structural Equation Modeling

The quality of the resulting model can be assessed by the absence of multicollinearity (Hair Jr et al., 2021) and the SRMR value, which ranges from 0.08 to 0.10 (Ringle et al., 2024). Multicollinearity among latent variables can be detected if the VIF values are less than 10. Table 11 presents the VIF values for each direct effect.

Table 11. VIF Values for Each Direct Effect

Hypothesis	VIF
H1: X → Z1	1.636
H2: X → Z2	1.000
H3: X → Y	1.000
H4: Z1 → Y	1.116
H5: Z2 → Y	1.509

The VIF values for each direct effect between the latent variables were below 10, indicating no multicollinearity in the model. Furthermore, the SRMR value was 0.084, which falls within the range of 0.08–0.10. Therefore, the model fits well.

4.7. Discussion

4.7.1. The Effect of Managerial Cognitive Capability on Organizational Change Capability

The findings indicate a statistically significant negative relationship, as reflected in the path coefficient of −0.322. This suggests that higher managerial cognitive capability does not necessarily translate into stronger organizational change capability. One possible explanation is that managers who rely heavily on their cognitive expertise may adopt centralized decision-making and directive management styles, emphasizing instructions over employee participation, autonomy, and independent problem solving.

Such practices may limit employees' opportunities to develop new competencies, contribute innovative ideas, and adapt to organizational changes, potentially weakening their overall capacity to bring about change. Nevertheless, this interpretation should be treated as a plausible explanation rather than a definitive conclusion, since organizational culture, leadership practices, employee empowerment, and institutional contexts may also shape the observed relationship.

These findings align with those of Adna and Sukoco (2020), who reported that organizational capacity for change mediates the relationship between managerial cognitive abilities and organizational performance. Their findings underscore the importance of considering organizational change capability as an intervening mechanism through which managerial capabilities influence organizational outcomes. However, the negative coefficient observed in this study indicates that the relationship between managerial cognition and organizational change capabilities may be more complex than anticipated.

4.7.2. The Effect of Managerial Cognitive Capability on Leadership Effectiveness

The findings indicate that managerial cognitive capability (X) has a positive and significant effect on leadership effectiveness (Z2), as reflected by the path coefficient of 0.581. This suggests that hospital directors with stronger cognitive capabilities are more likely to demonstrate effective leadership through analytical reasoning, strategic thinking, problem-solving, and informed decision-making. These capabilities enable directors to interpret complex organizational situations, anticipate potential challenges, evaluate alternative courses of action, and align their decisions with organizational objectives.

In the hospital context, these competencies are especially important because leaders must balance

the clinical service quality, operational efficiency, financial sustainability, and expectations of multiple stakeholders. This finding aligns with that of Pramudita et al. (2025), who found that managerial cognitive and emotional capabilities positively influence paradoxical leadership, with cognitive capabilities exerting a stronger effect. Cognitive capabilities may help leaders recognize and reconcile competing organizational demands, whereas emotional capabilities may help them manage interpersonal relationships and navigate stakeholder tensions.

Souza and Forte (2019) examined the cognitive and emotional dimensions of paradoxical leaders' dynamic managerial capabilities, highlighting the importance of perception, problem solving, language, communication, social cognition, and focused mental activities in organizational strategic change. Collectively, these studies suggest that managerial cognitive capability is an important foundation for leadership effectiveness because it enables leaders to process complex information, formulate appropriate responses, and manage competing priorities. Nevertheless, the present findings establish a positive effect of managerial cognitive capability on leadership effectiveness within the specified research model. The possibility of a reciprocal influence between cognition and leadership effectiveness requires further investigation.

4.7.3. The Effect of Managerial Cognitive Capability on Sustainable Performance

The findings indicate that managerial cognitive capability (X) has no statistically significant effect on sustainable performance (Y), as reflected in the reported negative path coefficient of −0.036. This finding suggests that managerial cognitive capability may not directly translate into improved sustainability. Instead, its influence may operate indirectly through the development and deployment of internal organizational capabilities, such as strategic decision-making, organizational learning, resource integration, and adaptive capacity.

In this regard, managers' cognitive abilities may be more important for interpreting complex environmental conditions and shaping organizational responses than for directly generating measurable sustainability outcomes. One possible explanation concerns the role of managerial characteristics in strategic decision-making. Factors such as CEO age, organizational tenure, and educational background may influence how executives interpret information, evaluate strategic alternatives, and determine the extent of organizational change.

Managerial cognition helps decision makers reconcile empirical evidence, historical experiences, alternative courses of action, and future projections. However, the effectiveness of these cognitive processes depends on managers' ability to interpret relevant information and translate their judgments into appropriate strategies. Prior experience can provide valuable cognitive frameworks for recognizing environmental changes and anticipating new challenges. Conversely, managers with limited experience may struggle to identify environmental shifts, assess strategic implications, and respond effectively to sustainability-related challenges.

Nevertheless, the absence of a statistically significant direct relationship does not necessarily mean that managerial cognitive capability is unimportant for organizational performance. Rather, its contribution may depend on intervening organizational mechanisms and contextual conditions. For example, managerial cognitive capability may enhance sustainable performance when supported by dynamic capabilities, effective knowledge management, organizational learning, and the resources required to implement strategic decisions.

4.7.4. The Effect of Organizational Change Capability on Sustainable Performance

The findings indicate that organizational change capability (Z1) has a significantly positive effect on sustainable performance (Y), with a path coefficient of 0.545. This suggests that an organization's ability to anticipate, initiate, and implement change is a key determinant of its capacity to achieve sustainable performance. Learning-oriented organizations are generally better positioned to identify emerging challenges, develop change initiatives, and formulate strategies to sustain their competitive advantages (Heckmann et al., 2016).

Establishing mechanisms for periodic leadership evaluation at multiple levels in Muhammadiyah hospitals may provide an institutional foundation for strengthening organizational change. However, the effectiveness of these mechanisms depends on whether the evaluation outcomes translate into organizational learning, leadership development, and continuous improvement in hospital management. Further exploration is needed to understand how organizational change capability contributes to sustainable performance across the economic, social, and environmental dimensions.

Although these findings demonstrate a positive relationship, the mechanisms by which organizational change capability drives sustainability outcomes remain unclear. Chen et al. (2026) highlighted that the relationship between organizational capabilities and sustainability performance, defined as meeting organizational stakeholders' demands while considering human welfare and ecological constraints, remains underdeveloped. This perspective suggests examining organizational change capability not only in terms of operational adaptation or preserving competitive advantage, but also in its capacity to integrate stakeholder interests, employee well-being, service quality, financial resilience, and environmental responsibility into strategic decision-making.

Future research could examine whether leadership evaluation, knowledge-sharing practices, organizational learning, and adaptive decision-making mediate or strengthen the relationship between organizational change capability and sustainable performance in Muhammadiyah hospitals. Longitudinal studies and comparative analyses across hospitals could further clarify how these capabilities evolve over time and under which organizational conditions they yield consistent sustainability outcomes.

4.7.5. The Effect of Leadership Effectiveness on Sustainable Performance

The findings suggest that leadership effectiveness (Z2) has a positive but statistically insignificant effect on sustainable performance (Y), as indicated by the path coefficient of 0.090. This result warrants further exploration of the underlying mechanisms through which leadership effectiveness may or may not translate into sustainable organizational performance. One possible explanation is that leadership effectiveness within Muhammadiyah hospitals in Central Java Province is predominantly assessed by the achievement of organizational goals and managerial targets rather than by integrating long-term sustainability objectives into strategic decision-making.

This interpretation aligns with the most prominent indicator of leadership effectiveness, which reflects managers' perceived success in achieving organizational goals during their tenure. Although goal attainment is an important dimension of managerial effectiveness, it does not necessarily reflect the capacity to maintain financial resilience, sustain continuous improvements in service quality, strengthen employee engagement, or ensure environmental and social responsibility over time. Consequently, leadership effectiveness that emphasizes short-term achievements may not yield measurable improvements in sustainable performance.

Furthermore, the distinctive characteristics of hospital organizations, including complex stakeholder relationships, resource constraints, regulatory requirements, and the need to balance clinical quality with financial viability, may weaken the direct link between leadership effectiveness and sustainability outcomes in hospitals. In this context, leadership effectiveness may indirectly influence sustainable performance through strategic capabilities, organizational learning, innovation, and developing a sustainability-oriented organizational culture. Karié (2023) emphasized the importance of emotional intelligence, resilience, and a growth mindset in enabling leaders to perform effectively in their roles.

These capabilities may be especially relevant in healthcare organizations, where leaders must respond to evolving stakeholder expectations and operational challenges while maintaining the organization’s viability. Nevertheless, the positive but statistically insignificant coefficient in this study should not be interpreted as evidence that leadership effectiveness is unimportant. This indicates that the present sample and model did not establish a statistically significant direct effect. Therefore, further research should investigate the potential mediating and moderating mechanisms, including strategic sustainability orientation, organizational culture, resource availability, and managerial time horizons, to clarify the conditions under which leadership effectiveness contributes to sustainable performance.

4.7.6. The Effect of Managerial Cognitive Capability on Sustainable Performance Through Organizational Change Capability

These findings indicate that managerial cognitive capability has a significant direct effect on organizational change capability, which in turn significantly affects sustainability performance. However, the negative mediating effect of organizational change capability (−0.175) suggests that its role in translating managerial cognitive capability into sustainable performance may be more complex than initially anticipated by the authors. This result warrants further investigation to determine whether organizational change capability constrains the realization of sustainability benefits, reflects potential inconsistencies between managerial cognition and organizational change processes, and indicates a suppression effect within the mediation model.

Furthermore, periodic evaluations of management and leadership performance systems may help organizations identify gaps in strategic decision-making, change implementation, and sustainability outcomes (Islam et al., 2020b). Therefore, future research should examine the contextual factors, organizational processes, and leadership practices that may explain this negative indirect effect and establish the conditions under which organizational change capability strengthens, rather than constrains, the relationship between managerial cognitive capability and sustainability. A negative indirect effect of −0.175 does not, by itself, establish that organizational change capability undermines SP.. The indirect effect should be interpreted alongside its bootstrapped confidence interval, the direct effect of managerial cognitive capability on sustainable performance, and the total effect.

4.7.7. The Effect of Managerial Cognitive Capability on Sustainable Performance Through Leadership Effectiveness

These findings suggest that the relationships between managerial cognitive capability, leadership effectiveness, and sustainable performance are more complex than anticipated. Although managerial cognitive capability (X) does not have a statistically significant direct effect on sustainable performance (Y), it does not necessarily imply that managerial cognition is irrelevant to sustainability. Rather, its influence may depend on an organization's ability to translate managerial knowledge, strategic understanding, and cognitive resources into effective practices.

Similarly, the non-significant direct effect of leadership effectiveness (Z2) on sustainable performance indicates that leadership effectiveness alone may be insufficient to produce measurable sustainability outcomes without complementary organizational mechanisms, implementation strategies, and resource support. The non-significant mediating effect of organizational change capability (Z1) further indicates that an organization's capacity to initiate and implement change does not significantly explain the relationship between managerial cognitive capability and sustainable performance in the context of this study.

This finding raises questions about whether organizational change capability is sufficient to translate managerial cognition into sustainability outcomes or whether its effectiveness depends on additional contextual factors, such as organizational culture, resource availability, employee engagement, and the consistency of sustainability-oriented implementation. Nevertheless, the positive mediating effect of leadership effectiveness (Z2), with a coefficient of 0.052, suggests a potentially positive indirect relationship between managerial cognitive capability and sustainable performance via leadership effectiveness. However, the statistical significance of this indirect effect must be established through an appropriate mediation test, such as bootstrapping, before concluding that mediation exists.

These findings can be further examined in light of Waqar et al. (2026), who indicated that supportive leadership directly encourages the adoption of eco-friendly buildings and strengthens sustainability cognition and perceived managerial abilities. This suggests that leadership may contribute to sustainability by shaping managerial awareness, facilitating the adoption of environmentally responsible practices, and encouraging sustainability-oriented decision-making. However, this relationship may vary across organizational settings because the adoption of specific environmental practices does not necessarily translate into broader sustainable performance outcomes.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

The results indicate a direct effect of managerial cognitive capability on organizational change capability and leadership effectiveness, and a direct effect of organizational change capability on sustainable performance. However, managerial cognitive capability and leadership effectiveness did not significantly affect sustainable performance. Organizational change capability significantly mediates the relationship between managerial cognitive capability and SP.. Leadership effectiveness does not significantly affect the relationship between managerial cognitive capabilities and sustainability performance. Health sector services initiated by the Islamic organization Muhammadiyah over a century ago attracted many parties to do the same, both socially and commercially, in Indonesia. Muhammadiyah faces competition not only from similar social organizations but also from several large national and global organizations.

The finding that leadership effectiveness neither directly drives sustainable performance nor mediates the relationship between cognitive capability and performance challenges the classic leadership-centric literature. In deeply institutionalized or value-driven organizations (such as century-old faith-based health networks), standardized organizational routines, institutional culture, and change execution

capability play a far more decisive role in sustainability than individual managerial style or perceived leadership effectiveness. However, consistent with the RBV's core limitation, static cognitive resources alone do not directly generate a competitive advantage or sustainable outcomes.

Cognitive capabilities serve as the necessary *micro-foundations* that must be operationalized through structural mechanisms. This study shows that managerial cognition yields sustainable outcomes only when it is mediated by dynamic change capabilities. This confirms that dynamic capabilities are the primary operational engines that transform managerial potential into actionable organizational adaptation. This study identifies organizational change capability as a key operational engine by demonstrating that it substantially mediates the relationship between managerial cognitive capability and sustainable performance.

To influence institutional performance, high-level cognitive models must make an organization ready for change, flexible, and structurally agile. Long-term organizational sustainability is not always the result of managerial intelligence, vision, and mental models alone, as evidenced by the lack of a direct correlation between managerial cognitive aptitude and sustainable performance. To produce lasting results, cognitive capacity must be translated into concrete operational procedures, particularly OC competencies. This study identifies organizational change capability as the key operational engine, demonstrating that it substantially mediates the relationship between managerial cognitive capability and sustainable performance.

Executive leadership (directors and deputy directors) and hospital boards should not rely solely on members' leadership skills. To implement institutionalized change mechanisms, such as rapid protocol updates, flexible decision-making frameworks, and ongoing staff adaptation initiatives, management must systematically translate their strategic vision into action. Muhammadiyah Hospitals cannot compete solely on corporate capital amid pressure from major national and international corporate health providers. Leaders must regularly update their understanding of contemporary healthcare demands using their cognitive talent to uphold their century-long purposes. This will involve reorganizing hospital operations to adapt quickly to changes in the market and technology.

Leaders must rethink how health services are conceptualized to remain relevant without losing their religious or social identity, ensuring that value-driven, nonprofit healthcare remains contemporary, operationally flexible, and financially sustainable. Strategic planning should explicitly incorporate organizational change capabilities into hospital governance. Given these challenges, Muhammadiyah Hospitals in Central Java must anticipate and adapt to ongoing changes. Reconstructing the thinking about health services at Muhammadiyah Hospitals in Central Java is necessary to adapt to the current context and maintain Muhammadiyah's agility and sustainability.

In this context, this study examines managerial cognitive capability, organizational change capability, leadership effectiveness, and sustainable performance. From a human resources perspective on Muhammadiyah's charitable efforts, leadership and leadership effectiveness should be a concern for the leadership (Director/Deputy Director) of Muhammadiyah Hospitals in Central Java. This study was limited to four variables: managerial cognitive capability (X) and sustainable performance (Y). The mediating variables, Z1 and Z2, are organizational change capability and leadership effectiveness, respectively. This study also had a sample of only 42 respondents, corresponding to the research population of Muhammadiyah Hospitals in Central Java Province.

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