A Cross-Sector Leadership Framework for Organizational Change and Sustainability: Testing the Impact of Intrinsic Leadership Values Using Structural Equation Modeling

Sudirman Said[1], Aurik Gustomo[2], Yudo Anggoro[3]
Doctoral Candidate, School of Business and Management, Bandung Institute of Technology (ITB), Bandung, Indonesia[1]
Professor, School of Business and Management, Bandung Institute of Technology (ITB), Bandung, Indonesia[2]
Director, School of Business and Management, Bandung Institute of Technology (ITB), Bandung, Indonesia[3]

Abstract*—Purpose: Leading involves challenging the status quo. A critical function of leadership is to drive change, ensuring both the immediate performance and long-term sustainability of organizations. Design/methodology/approach: Research on leadership, changes, and sustainability has focused predominantly on individual sectors—public, private, or non-profit. Despite the increasing demand for cross-sectoral collaborations, studies that encompass all three sectors—public, private, and non-profit organizations—are relatively scarce. Previous qualitative research has identified five Intrinsic Leadership Values (ILV), each supported by specific characteristics, and developed a unified leadership framework applicable across organizations in public, private, and non-profit sectors. Findings/results: These studies also revealed a universal pattern for managing changes that applies to organizations of all types. To understand the connections between ILV, Organizational Change (OC), Sustainable Change (SC), and Organizational Sustainability (OS), the research developed a framework that was analyzed through case studies. Practical implications: Building on the framework identified through earlier qualitative studies, this research uses a quantitative methodology to examine its generalizability. A purposive sampling survey of 580 respondents, holding managerial positions in public, private, and non-profit organizations in Indonesia, was conducted. Originality/value: Using Structural Equation Modeling (SEM) and Analysis of Moment Structures (AMOS) as analytical tools, this research corroborates previous findings: ILV has a significant impact on OC, which, in turn, enhances OS, while ILV has no influence on SC. It also confirms the reciprocal relationship among these constructs, with ILV serving as the pivotal unifying variable.

Keywords*—Intrinsic leadership values; organizational change; sustainable change; organizational sustainability; leadership development; cross-sector leadership; public-private-nonprofit collaboration; change management

I. Introduction

In modern society, the traditional boundaries between private, public, and social sectors are becoming increasingly blurred, leading to a rise in cross-sectoral collaboration. This trend is evident worldwide, with notable examples from various regions, for instance, in Tanzania, the government partnered with a private mobile phone company to provide life-changing health treatment [1]. In Austria, a consortium of nonprofit organizations acquired a large business, transforming it into a social enterprise. Across South America, countries like Mexico, Colombia, Chile, Brazil, and Argentina have embraced the concept of "business with purpose" [2], fostering collaboration between businesses, government institutions, NGOs, and society at large. Recognizing this trend, the World Economic Forum introduced the concept of "the fourth sector," emphasizing the convergence of public, private, and social organizations to address increasingly complex societal and sustainability challenges [3]. As organizational boundaries become less distinct, effective cross-sector collaboration depends not only on institutional arrangements but also on leadership capable of aligning diverse stakeholders, managing organizational change, and fostering long-term sustainability [4].

This shifting paradigm forces the traditional sectors—private, public, and non-profit—to reconsider their operational perspectives and ways of working. It necessitates ongoing changes in systems, strategies, and policies by entities already established with strong organizational structures and distinct characteristics [3]. A qualitative study conducted by the researcher sought to identify the Intrinsic Leadership Values (ILV) and characteristics that are relevant across the public, private, and social sectors. The study focused on six institutions representing diverse change initiatives, including reforms, transformation, rehabilitation, and reconstruction efforts [5-6]. These institutions include: the Agency for the Rehabilitation and Reconstruction Aceh-Nias (BRR Aceh-Nias) and the Ministry of Energy and Natural Resources (MEMR) from the public sector; PT Pertamina Persero (Pertamina) and PT Indika Energi Tbk. (IEG) from the private sector; and the Indonesian Institute of Accountants (IAI) and the Indonesian Society for Transparency (MTI) from the social sector. The researcher posited that analyzing the leadership, organizational dynamics, and stakeholder management within these organizations offers a comprehensive foundation for understanding ILV across these three sectors.

Despite extensive research on leadership, organizational change, and organizational sustainability, these streams of

research have largely evolved independently and have predominantly been examined within individual organizational sectors, such as the public, private, or non-profit sectors. As organizations increasingly collaborate across sectoral boundaries to address complex societal and sustainability challenges, there is a growing need to identify leadership principles that transcend sector-specific contexts. Existing leadership research has primarily focused on leadership styles, behaviors, and competencies, including transformational, authentic, ethical, and servant leadership, rather than examining Intrinsic Leadership Values (ILV) as a distinct theoretical construct that may underpin effective organizational change and long-term organizational sustainability across sectors. Moreover, empirical studies that quantitatively validate a unified leadership framework applicable across public, private, and non-profit organizations remain scarce, leaving limited evidence regarding the common leadership values that facilitate organizational change and sustainability in diverse organizational contexts.

The research also sought to examine the relationship model between ILV, Organizational Change (OC), Sustainable Change (SC), and Organizational Sustainability (OS) within these sectors. The study identified five dominant ILVs that are applicable across all three sectors: 1) trustworthiness, 2) visionary, 3) courageousness, 4) collaboration, and 5) transformation. Additionally, the study uncovered a common pattern of managing OC applicable across all sectors, which includes: 1) identifying opportunities for improvement, 2) organizing change agents, 3) mobilizing stakeholder support, 4) executing change agendas, and 5) institutionalizing the results of change (Said, Gustomo and Anggoro, 2023). Building on this understanding, the study develops a conceptual model that describes the relationships among the constructs of ILV, OC, SC, and OS.

II. Study Focus and Objectives

This study investigates whether a common set of Intrinsic Leadership Values (ILV) can explain organizational change and sustainability across public, private, and non-profit sectors. Rather than emphasizing differences among sectors, the study seeks to identify leadership values and organizational dynamics that are shared across diverse organizational contexts. By examining these commonalities, the study proposes a unified leadership framework that supports cross-sector collaboration and promotes long-term organizational sustainability.

A. Conceptual Framework of Intrinsic Leadership Values

Building on this research gap, the proposed framework conceptualizes ILV as a leadership construct that explains how leaders facilitate organizational change and sustainability across different sectors. While existing leadership research has largely emphasized leadership styles, behaviors, and intrinsic motivation, the proposed framework focuses on the fundamental values that shape leaders' decisions, behaviors, and interactions regardless of organizational context. These values are grounded in a leadership philosophy that promotes a shared vision, value alignment, empowered teamwork, and a collaborative organizational culture, thereby strengthening engagement, trust, and long-term organizational performance [7]–[10].

B. ILV Unifying Change and Sustainability

The qualitative study and literature review support the notion that ILV, supported by corresponding character traits, functions as an independent variable inherent in leaders. This view posits that ILV is the catalyst for initiating OC, CS, and fostering OS. In many cases, the transformational leadership style often plays a crucial role in preparing employees and organization members for change [10-14]. As an independent variable, ILV acts as the primary driver of change, capable of initiating, promoting, managing, and sustaining changes under any circumstances. When ILV interacts with other constructs within the model, its influence extends, impacting additional variables and amplifying its effects. This study reaffirms that leadership plays a determinant role in driving OC that leads toward sustainability.

C. Interdependency of OC, SC, and OS

OC, SC, and OS are recognized as interdependent variables that mutually influence one another. Initiatives aimed at OC not only drive efforts towards SC but also facilitate the formation of OS. Crises often serve as a primary driver for top leaders to initiate these changes [15-16], as observed in the Indonesian cases of the Agency of Rehabilitation and Reconstruction of Aceh and Nias (BRR Aceh-Nias), and the establishment of the Indonesian Society for Transparency (MTI). These variables take reciprocal routes; a sustainable organization, the goal of OC, significantly influences the nurturing and sustaining of a change culture, which is a crucial element for managing changes effectively. However, as interdependent variables, OC, SC, and OS do not operate in isolation [17-20]. Here, ILV plays an essential role as the unifying variable, fostering closer relationships among these variables and enabling their cohesive development. Acting as both the unifying variable and primary catalyst, ILV provides the flexibility necessary to influence the dynamics of OC [21-25]. The intervention could begin by initiating change processes, establishing or sustaining change culture, or contributing to the framework of a sustainable organization [26-31]. The research thus culminates in the presentation of a conceptual model, depicted in Fig. 1 below, illustrating these dynamics and interactions.

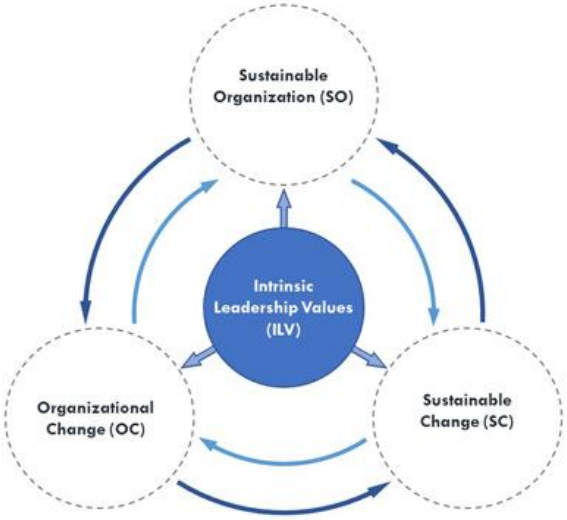

Fig. 1. Research model.

D. Hypotheses for Further Validation

To further validate the proposed conceptual model, the qualitative study formulates six hypotheses as follows: ILV significantly influences OC, SC, and OS across the public, private, and social sectors; OC significantly influences OS across the public, private, and social sectors; OS significantly influences SC across the public, private, and social sectors; SC significantly influences OC across the public, private, and social sectors; and OC significantly influences SC across the public, private, and social sectors, and significantly influences OS across the public, private, and social sectors.

These hypotheses are designed to explore the dynamic interrelationships and mutual influences among the key constructs of the study, thereby providing a deeper understanding of how ILV catalyzes sustainable organizational practices.

E. Methodology

This study proposes a conceptual model in which Intrinsic Leadership Value (ILV) influences Organizational Change (OC), Sustainable Change (SC), and Organizational Sustainability (OS). To quantitatively evaluate the proposed model, the researcher employed a non-recursive second-order Structural Equation Modeling (SEM) approach [32]. SEM is particularly well suited for testing hypotheses involving interdependent relationships among multiple variables simultaneously. Unlike recursive models, which assume clear and unidirectional causal relationships, non-recursive models account for bidirectional influences between variables. In second-order SEM, first-order latent variables are influenced by higher-order latent variables, allowing more abstract constructs to be represented through multiple underlying dimensions [32].

Because the proposed structural model includes reciprocal structural relationships among Organizational Change (OC), Sustaining Change (SC), and Organizational Sustainability (OS), the initial non-recursive SEM was underidentified. In non-recursive structural equation modeling, an underidentified model requires additional identification constraints before the structural parameters can be estimated. An unconstrained model estimated in AMOS indicated that three additional identification constraints were required before the model could be estimated. Accordingly, the structural paths ILV→OC, OC→OS, and SC→OC were specified as fixed parameters (1.0) to satisfy the identification requirements. This specification was retained because it is consistent with the proposed theoretical model and produced an identified, convergent, and stable solution (Stability Index = 0.921). The fixed paths served solely as identification constraints to enable model estimation and were not interpreted as empirical estimates of the corresponding structural relationships.

During the confirmatory factor analysis (CFA), the measurement model was refined by removing indicators and first-order constructs that did not satisfy the predefined measurement criteria, including acceptable standardized factor loadings, construct reliability, and convergent validity. The refinement process was guided by both statistical evidence and theoretical considerations rather than solely by model fit improvement, consistent with established SEM recommendations. Indicators and first-order constructs were retained only when they demonstrated satisfactory measurement properties and continued to represent the conceptual meaning of their corresponding second-order constructs.

F. Variables in the Model

In the previous exploratory study, qualitative research engaged 18 top management leaders from six organizations spanning public, private, and non-profit sectors. This study identified ILV and characteristics necessary for leaders to operate across sectors and uncovered elements crucial for organizational changes, sustaining these changes, and ensuring the organization's viability. Based on the conceptual model of this research (Fig. 1), ILV is considered an exogenous variable, while OC, SC, and OS are endogenous variables that have reciprocal relationships with one another. Both endogenous and exogenous variables (second-order) consist of latent variables (first-order), which are measured by several indicators. The second-order and first-order variables are presented in Table 1, along with related indicators.

TABLE I. VARIABLES AND INDICATORS USED IN THE CONCEPTUAL MODEL

Intrinsic Leadership Value (ILV)	Trustworthy	Ethical (A1), Accountable (A2), Committed (A3), Transparent (A4), Reputable (A5), Free from vested interest (A6)
	Courageous	Independent (B7), Authentic (B8), Confident (B9), Resilient (B10), Willing to deal with uncertainties (B11)
	Transformative	Empathetic (C12), Challenging the status quo (C13), Having systemic perspective (C14), Integrating concept with practice (C15), Developing new leaders (C16)
	Visionary	Clear goal and vision (D17), Fast learner (D18), Strategic thinker (D19), Role model (D20), Leaving legacy (D21)
	Collaborative	Aware of assets (E22), Managing stakeholders (E23), Effective networking (E24), Team oriented (E25), Managing transition (E26)
Organizational Change (OC)	Identifying room for improvement	Mapping the discrepancies (F27), Developing scope and change process (F28), Communicating the needs to change (F29)
	Organizing change agent	Formulate human resources needed as agent of change (G30), Identify potential resources to be utilized (G31), Managing team organization, Identify main stakeholder (G32)
	Mobilizing stakeholder support	Identify main stakeholder (H33), Communicating message about the need to change (H34), Invite stakeholder to participate in change process (H35)
	Executing changes	Structuring steps of change (I36), Ensuring the resources availability (I37), Implementing steps of change (I38),
Sustainability Change (SC)	Creating needs	Identifying gaps between the norm vs the actual (J39), Work develops scope of change (J40), Conceptualize the process (J41)

	Systemic changes	Aware of interconnectedness among the elements (J42), Effective communication (J43), engage stakeholders (J44)
	Build professional image	Implement professional culture (K45), Ensure the best practices of work (K46), Campaigning good practice (K47)
	Develop network	Explore the needed and existing network (L48), Mobilizing network to support changes (L49), Being open and welcoming to new network (L50)
	Succession planning	Aware of limited term of assignment (M51), Require leaders/manager to identify their successor (M52), Practice talent management system (M53)
Organizational Sustainability (OS)	Innovative	Always seeking new ways of doing business (N54), Challenge status quo (N55), Welcome new ideas (N56)
	Adaptable	Adjusting with new environmental demand (O57), Renewing strategy (O58), Developing team ability to be adaptive (O59)
	Stay relevant	Embrace learning culture (P60), Up to date with current trends and conditions (P61), Encourage members to stay up to date (P62)
	Embrace pluralism	Implement diversity culture (Q63), Sensitive to gender and vulnerable groups (Q64), Taking affirmative action (Q65)
	Contribute to society	Impact oriented (R66), Pay attention to sustainability aspect (R67), Engage with society (R68)
	Develop human potential	The leadership is a people leader (S69), Behave as a learning organization (S70), Nurturing leadership at all levels (S71)
	Continue producing goods & services.	Ensure their goods and services are relevant (T72), Explore and develop new products and services (T73), Stay efficient and competitive production cost (T74)

To test the interconnected dynamics between Intrinsic Leadership Values and organizational outcomes, this study deploys a Non-Recursive Second-Order Structural Equation Modeling (SEM) framework. This approach is methodologically imperative because it accounts for bidirectional feedback loops among the endogenous constructs while simultaneously handling the hierarchical structure of the latent variables. The operationalized framework conceptualizes the observed indicators as reflective manifestations of their respective first-order latent dimensions. The mathematical formulation for the measurement model is specified as follows:

$$X = \mathbf{\Lambda}_x \boldsymbol{\xi}^{(1)} + \boldsymbol{\delta}$$

$$Y = \mathbf{\Lambda}_y \boldsymbol{\eta}^{(1)} + \boldsymbol{\varepsilon}$$

In these formulations, X and Y represent vectors of the observed indicators mapping back to the exogenous and endogenous structures, respectively. The matrices $\mathbf{\Lambda}_x$ *and* $\mathbf{\Lambda}_y$ denote the first-order factor loadings. The vectors $\boldsymbol{\xi}^{(1)}$and $\$\boldsymbol{\eta}^{(1)}$ represent the first-order latent variables, while $\boldsymbol{\delta}$ and $\boldsymbol{\varepsilon}$ capture the unique measurement error vectors, which are assumed to be normally distributed with a mean of zero and uncorrelated with the latent variables.

To illustrate this mathematically for the *Trustworthy* (TW) dimension within the Intrinsic Leadership Value construct, the system of equations for its six manifest indicators ($A1$ through A6) is defined as:

$$\begin{bmatrix} A1 \\ A2 \\ A3 \\ A4 \\ A5 \\ A6 \end{bmatrix} = \begin{bmatrix} \lambda_{1,1} \\ \lambda_{2,1} \\ \lambda_{3,1} \\ \lambda_{4,1} \\ \lambda_{5,1} \\ \lambda_{6,1} \end{bmatrix} [TW] + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \end{bmatrix}$$

The second-order structural layer links the first-order latent dimensions to their broader, overarching higher-order constructs. In this phase, the first-order latent factors serve as reflective indicators for the second-order variables. The equations governing this tier are expressed as:

$$\boldsymbol{\eta}^{(1)} = \mathbf{\Gamma}^{(2)} \boldsymbol{\eta}^{(2)} + \boldsymbol{\zeta}^{(1)}$$

$$\boldsymbol{\xi}^{(1)} = \boldsymbol{\gamma}^{(2)} \boldsymbol{\xi}^{(2)} + \boldsymbol{\zeta}^{(2)}$$

Here, $\boldsymbol{\eta}^{(2)}$ and $\boldsymbol{\xi}^{(2)}$ represent the second-order endogenous and exogenous constructs. The terms $\boldsymbol{\zeta}^{(1)}$ and $\boldsymbol{\zeta}^{(2)}$ represent the structural disturbances at the first-order level, capturing the variance in the first-order dimensions not accounted for by the higher-order constructs. The analytical core of the proposed conceptual model lies in the simultaneous, bidirectional feedback loops among the three second-order endogenous variables: Organizational Change (η_{OC}), Sustainable Change (η_{SC}), and Organizational Sustainability (η_{OS}). These variables are driven by the overarching second-order exogenous variable, Intrinsic Leadership Value (ξ_{ILV}). The simultaneous structural equation system is formulated as follows:

$$\eta_{OC} = \beta_{1,2}\eta_{SC} + \beta_{1,3}\eta_{OS} + \gamma_{1,1}\xi_{ILV} + \zeta_{OC}$$

$$\eta_{SC} = \beta_{2,1}\eta_{OC} + \beta_{2,3}\eta_{OS} + \gamma_{2,1}\xi_{ILV} + \zeta_{SC}$$

$$\eta_{OS} = \beta_{3,1}\eta_{OC} + \beta_{3,2}\eta_{SC} + \gamma_{3,1}\xi_{ILV} + \zeta_{OS}$$

Within this structural system, $\beta_{i,j}$ represents the structural path coefficient pointing from endogenous variable j to endogenous variable i. The coefficient $\gamma_{i,1}$ designates the direct effect of the exogenous vector ξ_{ILV} on the i-th endogenous variable. The structural disturbances ζ_{OC}, ζ_{SC}, and ζ_{OS} represent the error components. Because the system is non-recursive, these disturbance terms are permitted to covary, meaning $E(\zeta_i, \zeta_j) \neq 0$ for $i \neq j$, which accounts for shared unobserved shocks across the endogenous processes.

To translate these simultaneous equations into a unified matrix framework using standard Jöreskog notation, the model is structured as:

$$\boldsymbol{\eta} = \mathbf{B}\boldsymbol{\eta} + \mathbf{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta}$$

Expanding this compact matrix notation yields the following structural matrix layout:

$$\begin{bmatrix}\eta_{OC}\\ \eta_{SC}\\ \eta_{OS}\end{bmatrix}=\begin{bmatrix}0 & \beta_{1,2} & \beta_{1,3}\\ \beta_{2,1} & 0 & \beta_{2,3}\\ \beta_{3,1} & \beta_{3,2} & 0\end{bmatrix}\begin{bmatrix}\eta_{OC}\\ \eta_{SC}\\ \eta_{OS}\end{bmatrix}+\begin{bmatrix}\gamma_{1,1}\\ \gamma_{2,1}\\ \gamma_{3,1}\end{bmatrix}[\xi_{ILV}]+\begin{bmatrix}\zeta_{OC}\\ \zeta_{SC}\\ \zeta_{OS}\end{bmatrix}$$

To isolate the endogenous vector $\boldsymbol{\eta}$ and resolve the system into its reduced form, we algebraically subtract $\mathbf{B\eta}$ from both sides, producing:

$$(\mathbf{I}-\mathbf{B})\boldsymbol{\eta}=\boldsymbol{\Gamma\xi}+\boldsymbol{\zeta}$$

Assuming that the matrix $(\mathbf{I}-\mathbf{B})$ is non-singular and invertible, the final reduced-form equation is derived as:

$$\boldsymbol{\eta}=(\mathbf{I}-\mathbf{B})^{-1}\boldsymbol{\Gamma\xi}+(\mathbf{I}-\mathbf{B})^{-1}\boldsymbol{\zeta}$$

Non-recursive models characterized by full, reciprocal feedback loops face critical identification challenges. A system where every endogenous variable directly influences every other endogenous variable risks being under-identified, rendering unique parameter estimation impossible.

To achieve formal identification, the system must satisfy the Order Condition, a necessary algebraic rule stating that the number of excluded variables from an individual equation must be greater than or equal to the total number of endogenous variables in the model minus one $(M-1)$. In this model, $M=3$, meaning each structural equation requires at least two exclusions $(3-1=2)$ to meet the order condition.

To satisfy both the Order Condition and the Rank Condition, this study introduces an instrumental variable exclusion strategy within the hierarchical framework. Rather than setting ξ_{ILV} as a singular aggregate predictor across all equations, the first-order exogenous dimensions are used as specialized structural instruments.

Specifically, the *Collaborative* $(\xi_{Collab})$and *Transformative* (ξ_{Trans}) dimensions are designated as direct drivers of Organizational Change (η_{OC}), while being excluded from the structural equations of η_{SC} and η_{OS}.Conversely, the *Visionary* $(\xi_{Vision})$and *Courageous* $(\xi_{Courage})$dimensions serve as direct instruments for Organizational Sustainability (η_{OS}). This empirical restriction modifies the $\boldsymbol{\Gamma}$ matrix by embedding zero-constraints, which mathematically satisfies the conditions for identification and allows the simultaneous system to be estimated.

Because non-recursive systems introduce inherent correlations between the endogenous regressors and the structural error terms, standard Ordinary Least Squares (OLS) estimation would yield biased and inconsistent parameters. Consequently, this study employs Full Information Maximum Likelihood (FIML) estimation to estimate all parameters simultaneously. If the indicator data exhibit significant deviations from multivariate normality, the model utilizes Asymptotically Distribution-Free (ADF) estimation or robust Maximum Likelihood estimators (MLR) with Satorra-Bentler corrections.

The estimation algorithm operates by minimizing the discrepancy between the sample covariance matrix $(\mathbf{S})$and the model-implied covariance matrix $\big(\boldsymbol{\Sigma}(\boldsymbol{\theta})\big)$. The mathematical derivation for the structural component of the implied covariance matrix is expressed as:

$$\boldsymbol{\Sigma}(\boldsymbol{\theta})=\mathbf{G}(\mathbf{I}-\mathbf{B})^{-1}(\boldsymbol{\Gamma\Phi\Gamma}'+\boldsymbol{\Psi})((\mathbf{I}-\mathbf{B})^{-1})'\mathbf{G}'+\boldsymbol{\Theta}_{\varepsilon}$$

In this overarching covariance formulation, $\boldsymbol{\Phi}$ represents the variance-covariance matrix of the exogenous latent dimensions, $\boldsymbol{\Psi}$ denotes the covariance matrix of the structural disturbances $(\boldsymbol{\zeta})$, $\mathbf{G}$ represents the combined matrix of first- and second-order factor loadings, and $\boldsymbol{\Theta}_{\varepsilon}$ captures the variance-covariance structure of the measurement errors. This systematic parameterization ensures that the feedback dynamics are isolated and evaluated with econometric precision.

III. Data Collection

To gather data in accordance with the model, the researcher assembles data collection tools. As the survey is the chosen method for data collection, a questionnaire is devised, as presented in Tables 1 through 4 above. Considering the research subject, participation is sought from respondents who have a basic understanding and involvement in the themes in their daily lives. For this reason, data collection is conducted using a purposive sampling survey method, aiming to select the most knowledgeable population as respondents. Purposive sampling, also known as judgmental sampling, is commonly used in studies involving small populations, such as case studies. The method requires the researcher to exercise judgment in selecting cases that best address the research questions and fulfill the research objectives [33-35]. Determining sample size requirements in a non-recursive second-order SEM presents unique statistical constraints (Fig. 2). Because the model contains a fully saturated feedback loop among the endogenous factors alongside an extensive hierarchical indicator network (74 manifest variables), standard heuristic guidelines like the 10: 1 item-to-response ratio would yield unrealistically large sample targets for an executive population.

Instead, sample size adequacy is evaluated using the mathematical framework established by MacCallum, Browne, and Sugawara for structural fit analysis based on the Root Mean Square Error of Approximation (RMSEA). The degrees of freedom (df) for a structural equation model are calculated using the standard equation:

$$df=\frac{1}{2}p(p+1)-q$$

where, p represents the total number of observed indicators $(p=74)$, and q represents the total number of free parameters to be estimated by the algorithm (including factor loadings, structural coefficients, item variances, and error covariances).

Given the large number of indicators, the model yields a high degree of freedom, which dramatically enhances statistical power. Under these parameters, a minimum sample size of $N=200$ to $N=350$ is statistically sufficient to achieve a power level exceeding 0.80 at a significance level of $\alpha=0.05$ for detecting close fit $(RMSEA<0.05)$.This critical mass provides enough empirical information to ensure that the inversion of the $(\mathbf{I}-\mathbf{B})$ matrix remains stable during numerical optimization, preventing the occurrence of Heywood cases or non-convergent solutions.

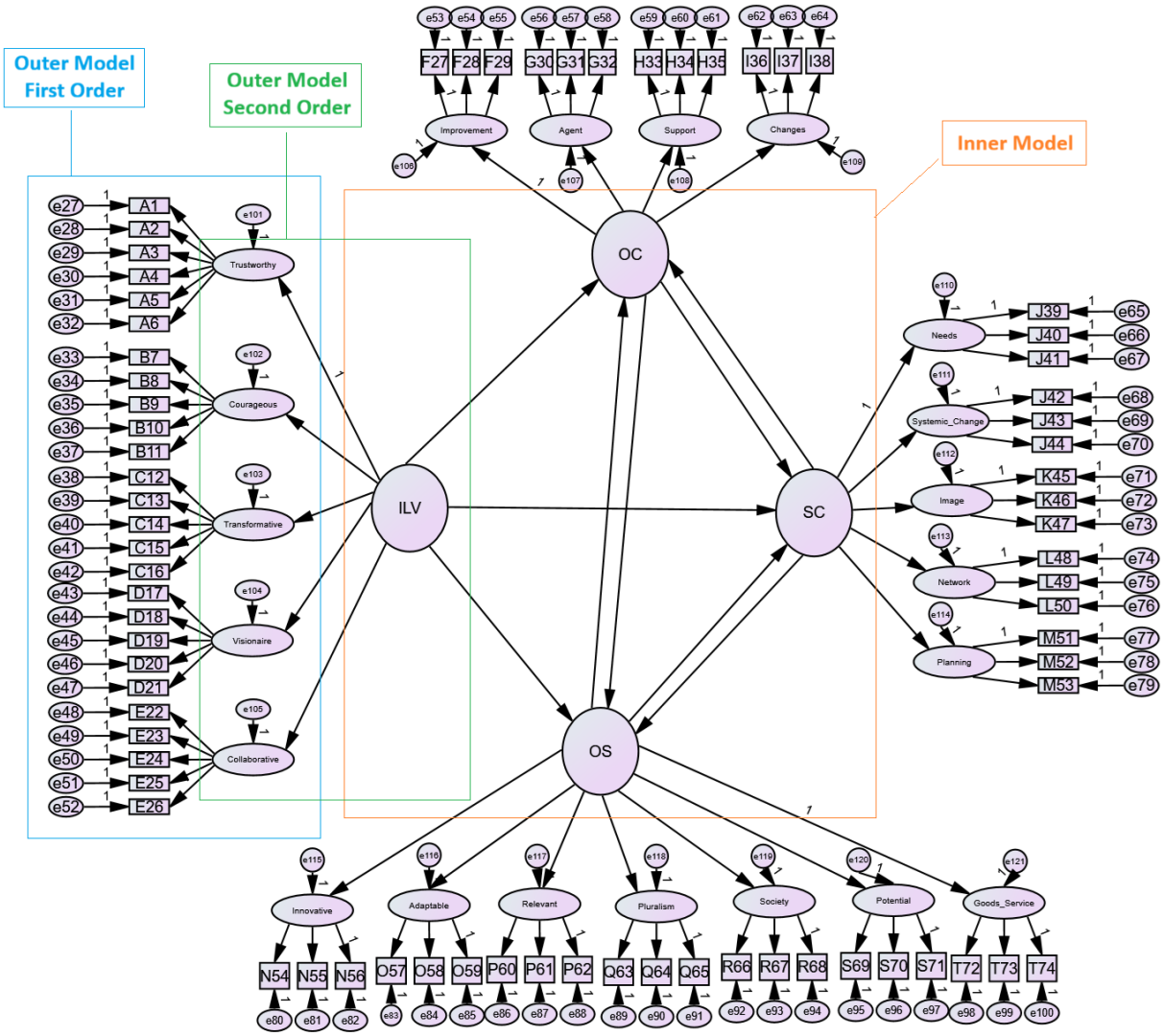

Fig. 2. Relationship model in Structural Equation Modeling (SEM).

IV. Results

Multicollinearity can result in distorted or inaccurate outcomes when a researcher or analyst tries to evaluate the effectiveness of each independent variable in predicting or explaining the dependent variable in a statistical model. Variance Inflation Factors (VIFs) can be used to assess the extent of multicollinearity, which is the correlation between indicators. VIF measures the degree to which the variance of the estimated regression coefficients is increased due to linear relationships among indicators. A VIF value exceeding 5.0 for an indicator suggests excessive collinearity [32]. All VIF values for the indicators of this construct were below the threshold of 5, indicating that there was no collinearity issue with the data. Therefore, the next step of estimating the relationships in the structural model can be conducted.

The SLF value is pivotal for evaluating the measurement model's quality and the constructs' validity. SLF represents the standardized regression weights that indicate the degree of association between each observed variable and its corresponding latent variable. Generally, an SLF value of 0.7 or higher is considered acceptable, indicating that the observed variable accounts for a substantial portion of the variance in the latent construct, while loadings between 0.5 and 0.7 may still be retained if the construct's composite reliability and average variance extracted remain adequate (Hair et al., 2019). Reliability is evaluated based on a construct's internal consistency. A Composite Reliability (CR) value of > 0.7 indicates high reliability, suggesting that the construct's indicators consistently measure the same concept. CR, like Cronbach's Alpha, measures the coherence among the indicators of a construct.

Table II shows construct indicators after the elimination process based on SLF value and the CFA process for identifying the Goodness of Fit (GoF) index. GoF is a measure used to assess how well the proposed model fits the observed data. A higher GoF value indicates a better fit, with values ranging from 0 to 1.0, where 1.0 signifies optimal alignment between the model and the data. To improve the GoF, the model may require modifications, such as removing certain indicators or adjusting variables and connections among indicators based on modification indices.

TABLE II. SLF, AVE, AND CR VALUE AFTER MODIFICATION

Latent Variables	Indicators	SLF	AVE	CR
Independent Variable: ILV				
Trustworthy (First Order)	A3. Committed	0.759	0.564	0.795
	A4. Transparent	0.72		
	A6. Free from Vested Interest	0.773		
Courageous (First Order)	B10. Resilient	0.828	0.706	0.828
	B11. Willing to deal with uncertainty	0.863		
Transformative (First Order)	C14. Challenging the Status Quo	0.807	0.577	0.803
	C15. Integrating concept with practice	0.75		
	C16. Developing new leaders	0.787		
Visionary (First Order)	D17. Clear goal and vision	0.83	0.662	0.887
	D18. Fast learner	0.808		
	D19. Strategic thinker	0.809		
	D21. Leaving legacy	0.824		
Collaborative (First Order)	E22. Aware of assets	0.847	0.693	0.900
	E24. Effective networking	0.814		
	E25. Team oriented	0.86		
ILV (Second Order)	Trustworthy	0.95	0.957	0.991
	Courageous	0.954		
	Transformative	0.969		
	Visionary	0.988		
	Collaborative	0.991		
Dependent Variable: OC				
Improvement (First Order)	F27. Mapping the Discrepancies	0.838	0.650	0.848
	F28. Develop scope & change process	0.879		
	F29. Communicating needs to change	0.927		
Organizing Change Agent (First Order)	G30. Formulate human resources needed as agent of change	0.916	0.764	0.866
	G31. Identify potential resources to be utilized	0.958		
Mobilizing Stakeholder Support (First Order)	H33. Identify main stakeholder	0.901	0.614	0.827
	H34. Communicating message needs to change	0.898		
	H35. Invite stakeholders to participate in the change process	0.824		
Changes (First Order)	I36. Structuring steps of change	0.888	0.665	0.856
	I37. Ensuring the availability of resources	0.911		
	I38. Implementing steps of change	0.908		
OC (Second Order)	Improvement	0.983	0.898	0.972
	Agent	0.955		
	Support	0.946		
	Changes	0.985		
Dependent Variable: SC				
Creating Needs (First Order)	J39. Identifying gap norm vs actual	0.92	0.640	0.842
	J40. Work develops scope of change	0.926		
	J41. Conceptualize the process	0.842		
Systemic Changes (First Order)	J43. Effective communication	0.913	0.699	0.823
	J44. Engage stakeholder	0.906		
Network (First Order)	L49. Mobilizing network to support changes	0.898	0.695	0.820
	L50. Being open to new network	0.881		
Succession Planning (First Order)	M52. Require leaders to identify a successor	0.885	0.672	0.804
	M53. Practice talent management system	0.919		
SC (Second Order)	Creating Needs	0.97	0.818	0.947
	Systemic Changes	0.961		
	Network	0.915		
	Succession Planning	0.916		
Dependent Variable: OS				
Innovative (First Order)	N54. Always seeking new ways of doing business	0.859	0.634	0.776
	N55. Challenge status quo	0.884		
Adaptable (First Order)	O58. Renewing strategy	0.903	0.591	0.742
	O59. Dev team to be adaptive	0.837		
Society (First Order)	R66. Impact oriented	0.819	0.552	0.712
	R68. Engage with society	0.838		
Potential (First Order)	S69. The leadership is a people leader	0.863	0.677	0.808
	S70. Behave as a learning organization	0.903		
Goods and Services (First Order)	T73. Explore and develop new products and services	0.884	0.633	0.775
	T74. Stay efficient and competitive	0.85		
OS (Second Order)	Innovative	0.986	0.887	0.975
	Adaptable	0.963		
	Society	0.975		
	Potential	0.949		
	Goods and Services	0.902		

Based on the SLF analysis, we excluded indicators A1 and B7 (Table I) due to their SLF values being less than 0.7. Further modifications to the model were made after conducting the CFA, leading to the elimination of indicators A2, A5, B8, B9, C12, C13, D20, D23, D26, G32, J42, K48, M51, N56, O57, R67, S71, and T72. Additionally, some latent variables were also eliminated, including Image (indicators K45–K47) as a latent

variable of SC, as well as Relevant (indicators P60–P62) and Pluralism (indicators Q63–Q65) as latent variables of OS.

The refinement process was guided by both statistical evidence and theoretical considerations rather than solely by model fit improvement, consistent with established SEM recommendations (Hair et al., 2019; Kline, 2023). Indicators and first-order constructs were retained only when they demonstrated satisfactory measurement properties and continued to represent the conceptual meaning of their corresponding second-order constructs.

TABLE III. THE VALUE OF GOODNESS OF FIT (GOF) CONSTRUCTS

GoF Index	Cutoff Value	GoF Model	Remark
X2-Chi Square	<28.869	2147.798	Poor Fit
Significance Probability	> 0.05	0	Poor Fit
DF	> 0	824	Good Fit
GFI	> 0.90	0.815	Marginal Fit
IFI	> 0.90	0.940	Good Fit
NFI	> 0.95	0.91	Good Fit
CFI	> 0.95	0.940	Good Fit
TLI	< 2.0	0.934	Good Fit
CMIN/DF	<0.05	2.804	Good Fit
RMSEA	<0.05	0.059	Good Fit
SRMR		0.045	Good Fit
Stability		0.921	Good Fit

After the validity and reliability assessments, all constructs achieved satisfactory GoF values as shown in Table III above.

The overall model fit is presented in Table III. The chi-square statistic was significant ($\chi^2 = 2147.798$, $p < .001$), and the Goodness-of-Fit Index (GFI = 0.815) was below the conventional threshold, indicating less than optimal absolute model fit. However, the chi-square statistic is well known to be highly sensitive to sample size and model complexity, often resulting in significant values even when the model adequately represents the observed data. Similarly, GFI has been criticized for its sensitivity to model complexity and sample size and is no longer recommended as a primary criterion for evaluating SEM model fit.

Therefore, model evaluation was based on multiple fit indices rather than any single statistic. The remaining fit indices, including RMSEA, CFI, TLI, and the normed chi-square (CMIN/DF), satisfied commonly accepted thresholds, indicating that the proposed model demonstrates an acceptable overall fit to the observed data despite the limitations reflected in the chi-square statistic and GFI.

The refinement of the measurement model has theoretical implications for the interpretation of the proposed framework. The exclusion of Build Professional Image from Sustaining Change and Stay Relevant, Embrace Pluralism, and Continue Producing Goods & Services from Organizational Sustainability suggests that these dimensions were not empirically supported within the present sample. Therefore, the final model should be interpreted as representing those dimensions of sustaining change and organizational sustainability that demonstrated adequate empirical support in this organizational context, rather than the full conceptual breadth originally proposed. Future studies should re-examine the excluded dimensions using independent samples and different organizational contexts to determine whether their exclusion reflects sample-specific characteristics or broader theoretical considerations.

Following the assessment of construct validity, reliability, and model fit, all latent constructs were integrated into a single structural model comprising Intrinsic Leadership Values (ILV), Organizational Change (OC), Sustaining Change (SC), and Organizational Sustainability (OS), referred to as the Full Construct Model (Fig. 3). The model was subsequently evaluated using a non-recursive structural equation modeling (SEM) approach. Because the proposed structural model includes reciprocal relationships among Organizational Change (OC), Sustaining Change (SC), and Organizational Sustainability (OS), the initial non-recursive SEM was underidentified. In accordance with established SEM procedures, additional identification constraints were required before the structural parameters could be estimated (Byrne, 2016; Kline, 2023). An unconstrained model estimated in AMOS indicated that three additional identification constraints were necessary. Accordingly, the structural paths ILV→OC, OC→OS, and SC→OC were specified as fixed parameters to satisfy the identification requirements. This specification was retained because it was consistent with the proposed theoretical model and produced an identified, convergent, and stable solution (Stability Index = 0.921). These fixed paths served solely as identification constraints and were not interpreted as empirical estimates of the corresponding structural relationships.

Following model identification, the structural model achieved an acceptable overall fit (Table III). Although the chi-square statistic was significant and the GFI indicated only marginal fit, the remaining fit indices, including IFI, CFI, TLI, RMSEA, SRMR, and CMIN/DF, satisfied commonly accepted thresholds, supporting the adequacy of the proposed structural model. The identified model therefore provided the basis for evaluating the freely estimated structural relationships. Table IV summarizes the structural parameter estimates. Because three structural paths were specified as identification constraints, hypothesis testing focused exclusively on the freely estimated relationships. The results indicate that ILV had a significant positive direct effect on Organizational Sustainability ($\beta = 0.205$, $p < 0.001$), whereas its direct effect on Sustaining Change was not statistically significant ($\beta = -0.021$, $p = 0.632$). Organizational Change exerted a significant positive effect on Sustaining Change ($\beta = 0.633$, $p < 0.001$), while Sustaining Change did not significantly influence Organizational Sustainability ($\beta = -0.360$, $p = 0.504$). Organizational Sustainability demonstrated a significant positive effect on Sustaining Change ($\beta = 0.550$, $p < 0.001$) and a significant negative reciprocal effect on Organizational Change ($\beta = -1.143$, $p < 0.001$) consolidated into a single model, called the Full Construct Model (Fig. 3). The analysis then continued with further GoF testing and a series of model modifications to achieve an acceptable model status, as depicted in Fig. 3.

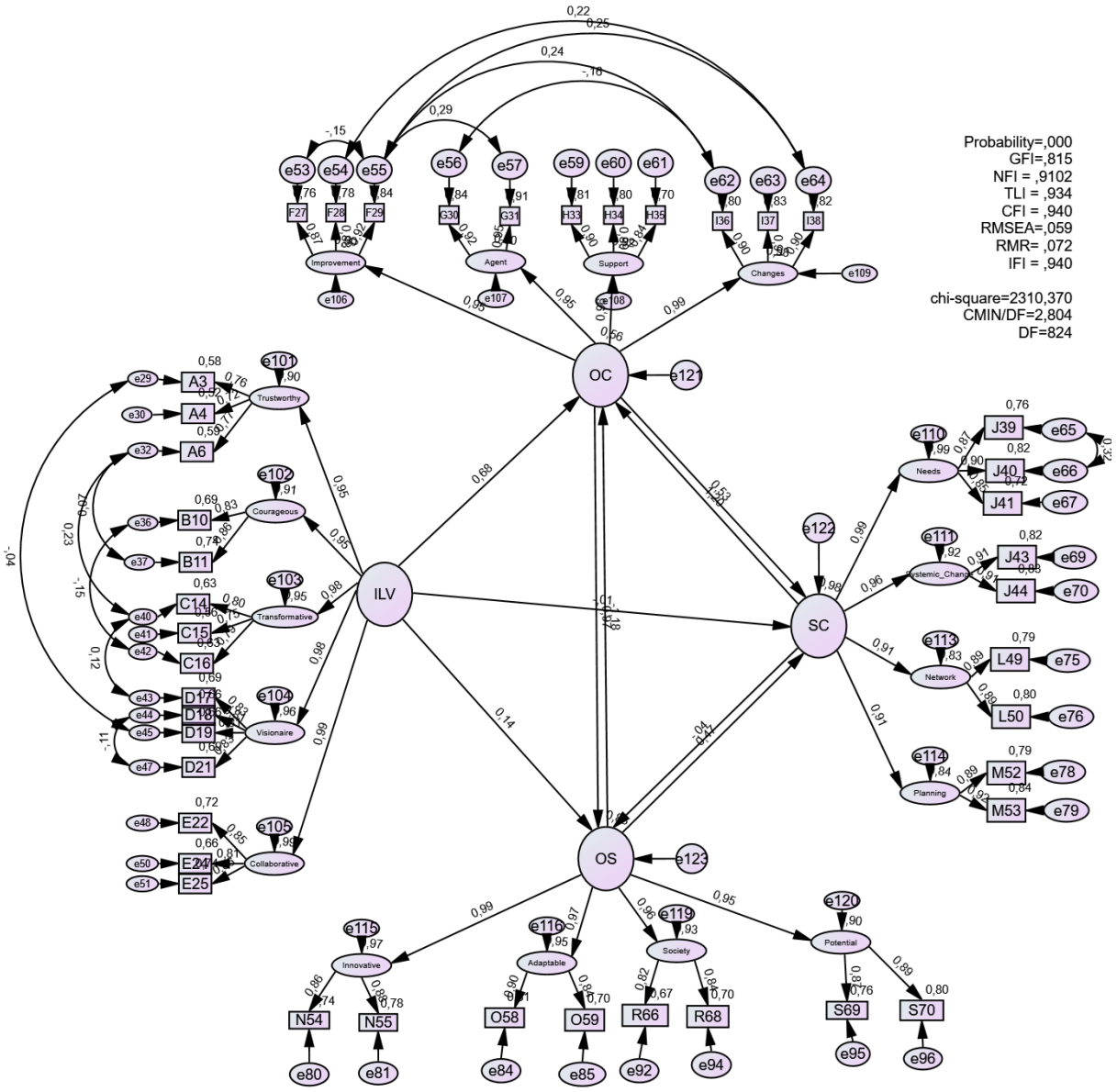

Fig. 3. Full construct model non-recursive.

Non-recursive structural equation models (SEMs) introduce distinct challenges related to functional stability and parameter identification, making the estimation of model parameters more complex. These models require the specification of certain paths that need to be set or restricted to predetermined values to ensure model stability and identifiability. The relationships between these variables were explored based on previous studies to identify constraint points. Previous research has shown strong influences among variables, such as the impact of ILV on OC, OC on OS, and SC on OC. Across various sectors, including public health, education, and management, leadership consistently emerges as a critical factor driving OC, highlighting its vital role, regardless of any debates about its importance [36-40].

Furthermore, studies have shown a strong relationship between OC and OS, as OC is essential for organizations to respond to external shifts and maintain relevance. Sustaining change is also critical for reinforcing organizational transformations. This process entails embedding new work processes and methods, integrating lessons learned, reinforcing new behaviors, evaluating change outcomes against organizational objectives, and developing actions for continuous improvement [41-44].

Following a series of GoF tests and modifications [45-47], the research resulted in an acceptable model, which served as the foundation for the next step: hypothesis testing. The significance analysis of the non-recursive full model is provided in the table below. The AMOS software was utilized as the analytical tool for significance testing, which measures the impact of interactions among variables. Statistically significant interactions indicate the intensity and dynamics of influences between variables and predictors. Table IV below presents the results of these analyses.

TABLE IV. HYPOTHESIS RESULT

Variables			Estimate	CR	P	Description
ILV	→	OC	Fixed			Identification Constraint
ILV	→	OS	0.205	3.501	***	Significant positive
ILV	→	SC	-0.021	-0.479	0.632	Not Significant
OC	→	SC	0.633	10.155	***	Significant positive
OC	→	OS	Fixed			Identification Constraint
SC	→	OC	Fixed			Identification Constraint
SC	→	OS	-0.36	-0.668	0.504	Not Significant
OS	→	OC	-1.143	-14.762	***	Significant negative
OS	→	SC	0.550	8.358	***	Significant positive

The quantitative analysis reveals that Intrinsic Leadership Values (ILV) do not have a statistically significant effect on Sustaining Change (SC), with a coefficient value of −0.021 and a p-value greater than 0.05. Despite this, intrinsic leadership values such as ethical behavior, strategic vision, adaptability, and a supportive approach are crucial for successfully navigating and implementing organizational change. These leadership qualities directly impact employee commitment, organizational culture, and the overall effectiveness of change initiatives ILV has a positive effect on OS, with a coefficient value of 0.205 and a p-value less than 0.05, indicating statistical significance. This significance highlights the critical role of leadership values in fostering organizational sustainability. ILV strengthens decision-making, encourages responsible behavior, and promotes ethical practices. Effective management of change, coupled with a leadership style that emphasizes sustainability, contributes to an improved organizational microclimate and enhanced interpersonal trust, ultimately guiding the team toward sustainable objectives.

V. CONCLUSION

This study developed and validated a cross-sector leadership framework that examines the relationships among Intrinsic Leadership Values (ILV), Organizational Change (OC), Sustaining Change (SC), and Organizational Sustainability (OS) using a non-recursive structural equation modeling approach. The findings indicate that ILV has a significant positive direct effect on Organizational Sustainability, whereas its direct effect on Sustaining Change was not statistically significant. The reciprocal relationships among OC, SC, and OS demonstrate that organizational change and sustainability are dynamic and mutually influential processes, highlighting the importance of integrating leadership values with organizational mechanisms that institutionalize and sustain change.

These findings have important practical implications for public institutions, corporations, and non-profit organizations. Organizations should strengthen Leadership Development Programs (LDPs) that cultivate intrinsic leadership values while simultaneously building organizational capabilities that support innovation, adaptability, stakeholder engagement, succession planning, and continuous learning. Rather than focusing solely on developing individual leaders, organizations should also establish systems that reinforce sustainable organizational practices and enable change to be embedded over time.

Given the increasingly interconnected nature of societal challenges, leadership development should also promote cross-sector understanding and collaboration. Programs such as Indonesia Mengajar illustrate how exposing leaders to different organizational and community contexts can broaden their perspectives, strengthen intrinsic leadership values, and enhance their capacity to develop collaborative solutions to complex social problems. Such experiences help leaders integrate strategic thinking with social responsibility, thereby supporting more sustainable organizational outcomes across sectors.

VI. LIMITATION

A limitation of this study is that measurement refinement resulted in the removal of 18 indicators and four first-order constructs. Although the retained constructs demonstrated satisfactory reliability and validity, the resulting measurement model represents a more focused operationalization of Sustaining Change and Organizational Sustainability than originally conceptualized. Future research should validate the revised measurement model using independent samples and examine whether the excluded dimensions can be replicated across different organizational and cultural contexts.

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