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THE INTERACTION OF STRATEGIC INTELLIGENCE AND STRATEGIC LEADERSHIP STYLES IN DEVELOPING DYNAMIC CAPABILITIES: EVIDENCE FROM IRAQI BANKS

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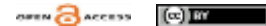
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ABSTRACT

Purpose- This study investigates the interactive role of strategic intelligence and strategic leadership styles in developing dynamic capabilities within Iraqi banks. It aims to clarify how leaders' strategic insight, future orientation, and leadership behaviors jointly contribute to enhancing organizational adaptability and sustaining competitive advantage in a turbulent and uncertain environment.

Methodology- A descriptive-analytical research design was employed. Data were collected through a structured questionnaire distributed to senior and middle managers in public and private Iraqi banks. Of the 130 questionnaires distributed, 120 valid responses were received, yielding a response rate of 92.3%. The data were analyzed using SPSS and AMOS to examine both the direct and interactive relationships among the study variables.

Findings- The results indicate that strategic intelligence and strategic leadership styles each exert a statistically significant positive effect on the development of dynamic capabilities. Furthermore, the interaction between strategic intelligence and leadership styles demonstrates a stronger influence on banks' abilities to sense environmental changes, seize emerging opportunities, and effectively reconfigure organizational resources.

Conclusion- The study concludes that integrating strategic intelligence into leadership practices is crucial for strengthening dynamic capabilities in the Iraqi banking sector. By promoting strategic awareness, adaptive leadership, and systematic environmental scanning, banks can enhance innovation, organizational resilience, and long-term competitiveness. This research contributes to the strategic management literature by offering empirical evidence from an emerging economy and emphasizing the combined impact of leadership and strategic intelligence on dynamic capabilities.

Keywords: Strategic intelligence, strategic leadership styles, dynamic capabilities, Iraqi banking sector, organizational adaptability, emerging economies

JEL Codes: M10, M12, G21

1. INTRODUCTION

Modern organizations operate in environments characterized by continuous instability, technological disruption, and intensified global competition. Rapid advancements in digital technologies, evolving customer expectations, and the increasing complexity of business ecosystems have amplified the importance of strategic foresight and adaptability (Zabel & O'Brien, 2024). In this context, strategically intelligent and visionary leadership is more crucial than traditional financial or physical assets, as effective leaders must anticipate change, promote learning, empower employees, and sustain long-term organizational vision (Mohammad et al., 2024).

Strategic leadership facilitates the formulation and implementation of strategies that align with environmental changes and organizational capabilities, while strategic intelligence equips decision-makers with analytical and perceptual tools to anticipate shifts, interpret signals, and design adaptive responses. Together, these constructs strengthen dynamic capabilities, defined as an organization's ability to sense opportunities, seize them, and reconfigure resources to maintain competitiveness (Zabel & O'Brien, 2024; Future Business Journal, 2025).

In emerging economies such as Iraq, banks face heightened uncertainty due to regulatory changes, economic fluctuations, and technological challenges. Developing dynamic capabilities is therefore critical for achieving operational stability and competitive advantage. However, limited empirical research has examined the integrated effect of strategic intelligence and leadership styles on dynamic capabilities within the Iraqi banking sector.

This study aims to fill this gap by investigating how the interaction between strategic intelligence and strategic leadership styles contributes to strengthening dynamic capabilities. The findings provide both theoretical insights and practical recommendations for enhancing resilience and strategic agility in Iraqi banks.

Despite the recognized importance of dynamic capabilities as a strategic approach to environmental changes, few studies have explored the drivers shaping their development in financial institutions, particularly in emerging economies (Zabel & O'Brien, 2024). Strategic leadership and strategic intelligence are considered key enablers of dynamic capabilities, guiding organizational transformation by shaping vision and enhancing leaders' analytical and perceptual abilities to respond to market shifts.

Interviews with senior managers in selected Iraqi banks (e.g., Middle East Bank and Ashur Bank) revealed limited awareness of dynamic capabilities and gaps in meeting customer expectations, highlighting the need to examine how leadership and intelligence jointly influence dynamic capability development. Accordingly, the research problem is articulated as follows: To what extent does the interaction between strategic intelligence and strategic leadership styles influence the development of dynamic capabilities in Iraqi banks?

To address this problem, the study poses the following research questions: (1) To what extent does strategic intelligence affect the development of dynamic capabilities in Iraqi banks? (2) To what extent do strategic leadership styles affect the development of dynamic capabilities? (3) How does the interaction between strategic intelligence and strategic leadership styles influence the development of dynamic capabilities?

The study aims to achieve the following objectives: examine the impact of strategic intelligence on developing dynamic capabilities, test the effect of strategic leadership styles on dynamic capabilities, and measure the combined (interactive) effect of strategic intelligence and strategic leadership styles on the development of dynamic capabilities in Iraqi banks.

1.1. Research Significance

The significance of this study stems from both theoretical and practical contributions. This paper is structured as follows: Section 2 presents the theoretical framework and literature review; Section 3 outlines the research methodology; Section 4 presents the results and analysis; Section 5 discusses the findings and concludes the study.

From a theoretical perspective, this study is among the first to empirically examine the combined impact of strategic intelligence and strategic leadership styles on the development of dynamic capabilities in Iraqi banks. By integrating leadership and intelligence theories within the broader framework of dynamic capabilities, it enriches the academic discussion and contributes to the growing literature on strategic management in emerging economies. These insights provide a deeper understanding of the mechanisms that support adaptability and resilience in turbulent environments.

From a practical perspective, the study offers valuable guidance for decision-makers in the banking sector. It highlights how strategic intelligence can be effectively integrated into leadership practices to drive innovation, creativity, and sustainable growth. Furthermore, it supports banking institutions in identifying and eliminating inefficiencies, enhancing their ability to allocate time, resources, and knowledge effectively, and designing strategic plans that strengthen dynamic capabilities amid environmental uncertainty.

1.2. Research Hypotheses

Based on the theoretical background and research questions, this study proposes three hypotheses. First, it is hypothesized that strategic intelligence, through its dimensions of insight, future vision, systems thinking, partnership, and motivation, has a statistically significant effect ($\alpha \leq 0.05$) on the development of dynamic capabilities in Iraqi banks. This hypothesis reflects the role of strategic intelligence in enhancing organizational adaptability and decision-making quality.

Second, it is proposed that strategic leadership styles, including transformational, transactional, and entrepreneurial leadership, exert a statistically significant effect ($\alpha \leq 0.05$) on the development of dynamic capabilities in Iraqi banks. This hypothesis underscores how different leadership approaches contribute to guiding organizational resources, fostering innovation, and sustaining competitive advantage.

Finally, the study examines the interactive effect of strategic intelligence and strategic leadership styles, hypothesizing that their interaction has a statistically significant effect ($\alpha \leq 0.05$) on dynamic capabilities development. This hypothesis highlights the potential synergy between intelligent decision-making and adaptive leadership in shaping the organization's ability to sense, seize, and transform in response to environmental changes.

1.3. Study Variables

The research model of this study is structured around three types of variables: independent, dependent, and demographic variables, which collectively aim to capture the relationships between strategic intelligence, strategic leadership, and dynamic capabilities in Iraqi banks.

The independent variables include strategic intelligence and strategic leadership styles. Strategic intelligence is conceptualized through five dimensions: insight, future vision, systems thinking, partnership, and motivation. These dimensions represent the cognitive and analytical capabilities that enable leaders to interpret complex environments, anticipate challenges, and make informed decisions. Strategic leadership styles, on the other hand, encompass transformational, transactional, and entrepreneurial leadership, each influencing organizational performance, adaptability, and innovation in distinct ways.

The dependent variable of the study is the development of dynamic capabilities, which reflects the organization’s ability to sense opportunities and threats, seize opportunities, and transform processes and structures to maintain competitiveness in a turbulent environment.

Finally, the study considers demographic variables such as gender, age, educational level, job position, and years of experience. These variables provide additional context for analyzing potential variations in how strategic intelligence and leadership styles influence dynamic capabilities across different employee groups.

1.4. Conceptual Model

The conceptual model of this study, illustrated in Figure 1, presents the hypothesized relationships among the study variables. It proposes that both strategic intelligence and strategic leadership styles influence the development of dynamic capabilities in Iraqi banks, both directly and interactively. This model provides a visual framework that underpins the study hypotheses, linking theory to empirical investigation.

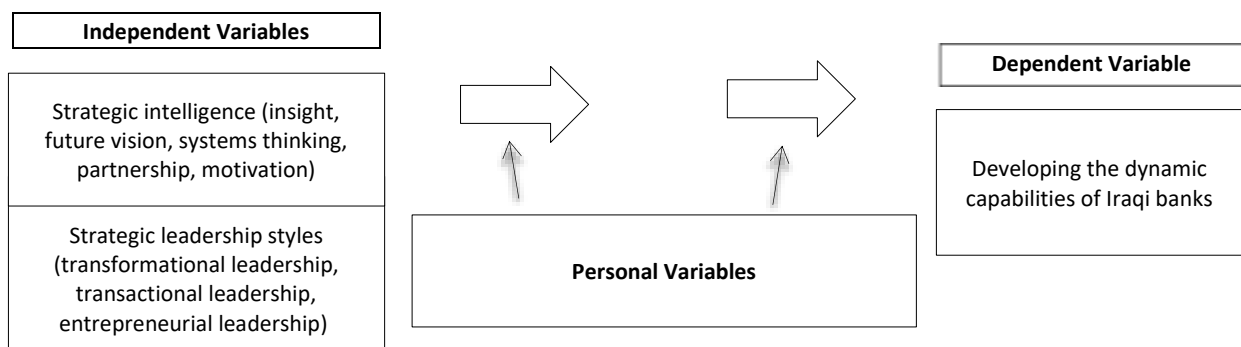
In particular, the model suggests that strategic intelligence, through its dimensions of insight, future vision, systems thinking, partnership, and motivation, enables organizations to anticipate environmental changes and make informed strategic decisions. Similarly, strategic leadership styles—transformational, transactional, and entrepreneurial—guide organizational resources and foster innovation, creativity, and adaptability.

Furthermore, the interaction between strategic intelligence and strategic leadership styles is expected to amplify the development of dynamic capabilities by combining analytical foresight with adaptive leadership practices. This synergy is especially critical in the context of Iraqi banks, where environmental uncertainty and market turbulence demand both intelligent decision-making and flexible leadership.

Figure 1: Conceptual Model of the Study
 (Strategic Intelligence → Dynamic Capabilities)
 (Strategic Leadership Styles → Dynamic Capabilities)
 (Strategic Intelligence × Strategic Leadership Styles → Dynamic Capabilities)

This conceptual framework serves as the foundation for testing the study hypotheses and guides the subsequent methodology and analysis.

Figure 1: Conceptual Model



2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Concept of Strategic Intelligence

Strategic intelligence is a fundamental managerial capability that enables organizations to anticipate environmental changes, interpret market dynamics, and formulate adaptive strategies through the systematic collection, analysis, and interpretation of critical information. This capability supports strategic decision-making and long-term organizational sustainability in dynamic and competitive environments (Al Khasabah & Al-Badayneh, 2025; Mohammad et al., 2024).

Recent literature also indicates that strategic intelligence contributes significantly to organizational resilience and competitive

sustainability by enabling firms to integrate environmental information into proactive strategic responses. According to Mohammad et al. (2024), organizations that effectively combine strategic intelligence with strategic flexibility demonstrate superior adaptability and performance in uncertain business environments.

Recent research emphasizes that strategic intelligence significantly influences how firms adapt to complexity, integrate data into strategic planning, and enhance organizational performance, especially under high uncertainty. For instance, studies in financial institutions have highlighted the role of strategic intelligence in shaping creative responses to environmental demands and organizational agility (Al Khasabah & Al-Badayneh, 2025). Virtus Inter Press Furthermore, empirical work linking strategic intelligence, leadership, and performance suggests that the interplay of these constructs may vary depending on context and implementation, underscoring the need to examine these relationships in settings like banking where volatility and complexity are prominent (Mohammad et al., 2024).

In the context of this study, strategic intelligence is conceptualized as a set of cognitive and analytical processes that equip leaders with foresight and environmental understanding essential for developing dynamic capabilities. This conceptualization forms the theoretical foundation for Hypothesis H1, which posits that strategic intelligence, through its dimensions, significantly affects the development of dynamic capabilities in Iraqi banks. By enhancing leaders' ability to sense opportunities and threats and align organizational resources effectively, strategic intelligence contributes to improved adaptability and sustained competitiveness.

2.2. Dimensions of Strategic Intelligence

Strategic intelligence is typically conceptualized through five interrelated dimensions that collectively enhance an organization's ability to perceive, interpret, and respond to environmental complexities. The first dimension, Insight, refers to the cognitive capability to understand complex situations, identify relevant patterns, and generate interpretations that support strategic decision-making. Recent studies in organizational contexts highlight insight as essential for recognizing subtle changes in market conditions and competitive environments, thereby enabling proactive strategic action (Al Khasabah & Al-Badayneh, 2025; Qamran & Shabani, 2024).

The second dimension, Future Vision, involves forming a clear and compelling image of the desired future state that guides strategic direction and aligns organizational efforts toward long-term goals. In dynamic environments, future vision helps leaders set priorities, anticipate opportunities, and mobilize resources in anticipation of future shifts. Empirical evidence suggests that a well-articulated future vision enhances strategic alignment and organizational responsiveness (Al Khasabah & Al-Badayneh, 2025; Qamran & Shabani, 2024).

A third dimension, Systems Thinking, reflects the ability to understand interdependence within the organization and between the organization and its external environment. Systems thinking enables leaders to analyze how various subsystems interact, anticipate unintended consequences, and make integrative decisions that consider both short- and long-term impacts. Recent literature emphasizes the importance of systems thinking in strategic management for navigating complexity and enhancing organizational coherence (Kunc, 2024).

Moreover, systems thinking has recently gained increasing importance in strategic management literature because it enhances organizational understanding of interconnected processes and supports holistic decision making. Kunc (2024) emphasized that organizations applying systems thinking are more capable of managing complexity and improving strategic responsiveness in dynamic environments.

Partnership Thinking constitutes the fourth dimension and refers to an organization's capacity to build and maintain collaborative relationships and networks that facilitate knowledge sharing and mutual value creation. Strategic partnerships are increasingly recognized as critical for accessing external resources, co-creating innovations, and enhancing organizational resilience in uncertain environments (Al Khasabah & Al-Badayneh, 2025; Qamran & Shabani, 2024).

Finally, Motivation represents the internal and external drivers that influence individuals and teams to pursue strategic objectives with commitment and enthusiasm. Motivation underpins the proactive behaviors necessary for adaptive performance and supports the sustained implementation of strategic initiatives. Research indicates that motivation interacts with other strategic intelligence dimensions to strengthen organizational performance and innovation outcomes (Al Khasabah & Al-Badayneh, 2025; Qamran & Shabani, 2024).

Together, these five dimensions provide a comprehensive framework for understanding how strategic intelligence enables organizations to adapt to complexity and achieve competitive sustainability.

2.3. Importance of Strategic Intelligence

Strategic intelligence enhances organizational success by enabling institutions to anticipate, interpret, and respond effectively to dynamic environments. It allows organizations to identify competitive forces through environmental scanning and competitor analysis, improving market responsiveness and strategic positioning (Al Khasabah & Al-Badayneh, 2025; Qamran & Shabani, 2024).

It also supports evidence-based decision-making, providing leaders with data-driven insights to formulate strategies that enhance adaptability and performance (Mohammad et al., 2024). Additionally, strategic intelligence helps organizations anticipate market shifts and maintain long-term viability by forecasting trends, recognizing potential disruptions, and aligning resources proactively (Al Khasabah & Al-Badayneh, 2025).

Overall, strategic intelligence forms a foundation for developing dynamic capabilities critical for navigating uncertainty and achieving sustainable competitive advantage.

2.4. Concept of Strategic Leadership

Strategic leadership refers to the ability of leaders to guide organizations toward long-term success by influencing others to make decisions that ensure adaptability and sustained performance in complex and dynamic environments. Unlike operational leadership, which focuses on day-to-day tasks, strategic leadership emphasizes setting a clear direction, aligning resources, and fostering a culture of innovation and resilience that enables organizations to navigate change and uncertainty effectively (Bentley University, 2025).

Effective strategic leaders not only anticipate future challenges and opportunities but also integrate vision with action, mobilize resources, and empower others to contribute to shared goals. They balance immediate operational needs with long-term strategic priorities, helping organizations adapt to market shifts and maintain competitiveness. Recent research highlights the critical role of strategic leadership in enhancing organizational learning, innovation, and adaptation, particularly in turbulent environments where foresight and flexibility are essential (Kebede et al., 2024; Journal of Business and Strategic Management, 2025).

Recent studies further suggest that strategic leadership strengthens organizational agility and innovation by promoting strategic alignment and adaptive capabilities. Al Fahad and Al Otaibi (2024) found that strategic leadership positively influences organizational responsiveness and innovation performance, particularly in financial institutions operating under uncertain market conditions.

In the context of this study, strategic leadership is conceptualized as a multidimensional capability that enables leaders to anticipate change, set strategic direction, allocate resources effectively, and integrate internal capabilities with external opportunities. This conceptualization supports Hypothesis H2 by linking strategic leadership to the development of dynamic capabilities in Iraqi banks.

2.5. Objectives of Strategic Leadership

Strategic leadership focuses on guiding organizations toward sustained success by aligning vision, strategy, and resources with long-term objectives. Its key objectives include building and communicating a shared organizational vision, fostering a sense of purpose and direction among employees, and promoting adaptability and innovation to navigate turbulent environments. Additionally, strategic leadership aims to develop future leaders through empowerment, mentoring, and continuous learning, ensuring leadership continuity and organizational resilience. Finally, it seeks to sustain competitive advantage by optimizing resource allocation and integrating internal capabilities with emerging opportunities. Recent studies highlight that organizations practicing strategic leadership with these objectives demonstrate higher levels of innovation, agility, and long-term performance (Al-Fahad & Al-Otaibi, 2024; Kebede et al., 2024).

2.6. Strategic Leadership Styles

Strategic leadership manifests through several key styles, each influencing organizational outcomes in distinct ways. Transformational leadership focuses on inspiring and motivating followers to exceed expectations by communicating a compelling vision, encouraging innovation, and fostering personal development. Recent research shows that transformational leaders significantly enhance organizational innovation performance and adaptability, particularly in dynamic business environments, by promoting creative thinking and a shared commitment to strategic goals (Agazu et al., 2025; The Influences of Transformational Leadership, 2024).

In contrast, transactional leadership emphasizes structured exchanges between leaders and followers, relying on clear role definitions, contingent rewards, and corrective actions to maintain stability and performance standards. Empirical evidence suggests that transactional leadership contributes to organizational effectiveness by reinforcing task accomplishment and discipline, especially where operations require consistency and clarity (Impact of Leadership Styles on Organizational Agility, 2025).

Entrepreneurial leadership, meanwhile, integrates innovativeness, opportunity recognition, and risk-taking, driving organizational agility and creative problem-solving. Studies indicate that both entrepreneurial and transformational leadership positively influence employees' innovative behavior and intellectual agility, enhancing performance outcomes in competitive and uncertain contexts (Irshad et al., 2023).

Furthermore, transformational leadership has been widely associated with organizational learning, employee empowerment, and sustainable performance improvement. Agazu et al. (2025) concluded through a systematic literature review that transformational leadership significantly contributes to firm performance by enhancing innovation, commitment, and organizational adaptability.

Together, these leadership styles provide a comprehensive view of how strategic leaders can mobilize resources, foster innovation, and sustain competitive advantage, particularly in sectors such as banking where environmental turbulence and complexity demand both visionary and adaptive leadership approaches.

2.7. Concept of Dynamic Capabilities

Dynamic capabilities refer to an organization's ability to purposefully integrate, build, and reconfigure internal and external competencies in order to address rapidly changing environments and sustain competitive advantage. These capabilities go beyond ordinary operational routines and focus on adaptability, innovation, and strategic renewal (Teece et al., 1997; recent conceptualizations). Modern studies emphasize that dynamic capabilities enable firms to continuously adapt their structures and resources, facilitating responsiveness to technological shifts and market dynamics (Zabel & O'Brien, 2024; Future Business Journal, 2025).

The theoretical foundation of dynamic capabilities is strongly rooted in the work of Teece et al. (1997), who emphasized the importance of sensing opportunities, seizing resources, and transforming organizational structures to maintain competitive advantage. Later, Teece (2007) further explained that dynamic capabilities enable firms to continuously renew competencies and adapt effectively to environmental turbulence.

Scholars commonly classify dynamic capabilities into three core components. Sensing involves the organization's ability to scan and interpret internal and external environments to identify emerging opportunities and threats, which often requires systematic information processing and market intelligence. Seizing refers to the capacity to mobilize and allocate resources effectively to capture value from identified opportunities, reflecting proactive strategic action. Transforming involves continuously reconfiguring organizational processes, structures, and routines to align with environmental changes and ensure long-term competitiveness. These components collectively enable the organization to navigate uncertainty, pursue innovation, and sustain performance in volatile contexts.

In dynamic sectors such as banking—especially within emerging economies like Iraq—the development of dynamic capabilities is critical. These capabilities support institutions in responding to economic volatility, regulatory changes, and digital transformation, enabling them to remain resilient and competitive amid ongoing disruption. Recent applications of dynamic capabilities theory underline their role in enhancing innovation performance and organizational adaptability across diverse industries.

2.8. Objectives of Developing Dynamic Capabilities

The development of dynamic capabilities aims to enhance organizational performance by improving adaptability to technological and environmental changes, promoting innovation and organizational learning, and strengthening efficiency in resource allocation. Ultimately, these capabilities support long-term organizational survival and competitiveness in dynamic and uncertain environments. Recent research highlights that organizations leveraging dynamic capabilities are better positioned to adapt, innovate, and maintain a competitive edge (Zabel & O'Brien, 2024).

2.9. Linking Strategic Intelligence and Strategic Leadership to Dynamic Capabilities

Recent studies suggest that strategic intelligence and strategic leadership jointly play a critical role in developing dynamic capabilities. Strategic leaders use intelligence systems to anticipate trends and make informed decisions, while strategic intelligence provides the cognitive and analytical tools necessary for creativity, sound judgment, and adaptive responses. The interaction between these two constructs enhances an organization's ability to sense environmental changes, interpret complex information, and respond effectively, forming the foundation for dynamic capabilities. In highly uncertain sectors, such as banking in Iraq, the synergy between intelligent analysis and adaptive leadership is a decisive factor for achieving organizational resilience and sustaining competitive advantage (Mohammad et al., 2024).

3. RESEARCH METHODOLOGY

3.1. Study Population and Sample

The study population consists of senior and middle-level managers working in Iraqi public and private banks. A purposive sampling technique was used to target respondents directly involved in strategic decision-making, leadership practices, and organizational development.

A total of 130 questionnaires were distributed, of which 120 were returned and validated, while 10 questionnaires were not returned, resulting in a 92.3% response rate, which is statistically acceptable and enhances the representativeness and reliability

of the data.

Table 1: Sample Response

Status	Distributed	Not Returned	Valid for Analysis
No.	130	10	120
Percentage	%100.0	%7.7	%92.3

Demographic Characteristics of Respondents

To support the validity of the analysis, demographic variables were examined, including gender, age, academic qualification, years of experience, and job title. The results show:

- Gender: 68% male, 32% female
- Age groups: Majority aged between 35–45 years (47%)
- Education level: 61% hold a bachelor’s degree, 29% master’s degree, and 10% PhD
- Experience: 54% have more than 10 years of experience
- Job positions: 41% senior managers, 59% middle managers

These demographics indicate that the respondents possess the required experience and managerial exposure needed to provide reliable insights regarding strategic intelligence, leadership practices, and dynamic capabilities in the banking sector.

3.2. Research Instrument

The primary tool for data collection was a structured questionnaire designed to measure the study’s core variables. The first part of the instrument measures Strategic Intelligence across five dimensions: Insight, Future Orientation, Systems Thinking, Partnership, and Motivation. Each dimension focuses on the bank’s ability to scan the environment and empower human capital. The second part evaluates Strategic Leadership Styles, encompassing Transformational, Transactional, and Entrepreneurial leadership models. Finally, the third part assesses Dynamic Capabilities through 12 items focused on resource reconfiguration and environmental adaptation. All items were measured using a five-point Likert scale, and the full questionnaire is provided in the Appendix of this study.

3.3. Questionnaire Reliability

Reliability reflects the extent to which a measurement instrument consistently assesses the intended construct across time and different samples. Internal consistency is commonly evaluated using Cronbach’s Alpha, where values of 0.70 or higher indicate acceptable reliability. In this study, Cronbach’s Alpha coefficients were calculated for all scales, and as summarized in Table 2, each scale exceeded the 0.70 threshold, demonstrating strong internal consistency and confirming the reliability of the questionnaire (Zabel & O’Brien, 2024).

Table 2: Cronbach's Alpha Coefficient Results

Scale	Code	No. of Items	Cronbach's Alpha Coefficient
Insight	I	4	0.898
Future Orientation	FO	4	0.855
Systems Thinking	ST	4	0.858
Partnership	P	4	0.85
Motivation	M	4	0.869
Strategic Intelligence	SI	20	0.891
Transformational Leadership	TFL	6	0.915
Transactional Leadership	TSL	6	0.869
Entrepreneurial Leadership	EL	6	0.858
Strategic Leadership Styles	SLS	18	0.919
Dynamic Capabilities	DC	12	0.936

Source: SPSS V.28 Output

3.4. Split-Half Reliability

To further assess the internal consistency of the measurement instrument, the split-half method was applied. The analysis yielded a Spearman-Brown coefficient of 0.918 and a Guttman split-half coefficient of 0.915, indicating high reliability across different halves of the questionnaire. These results confirm that the instrument consistently measures the intended constructs under varying conditions and across different items, demonstrating strong reliability (Zabel & O’Brien, 2024).

Table 3: Split-Half Test

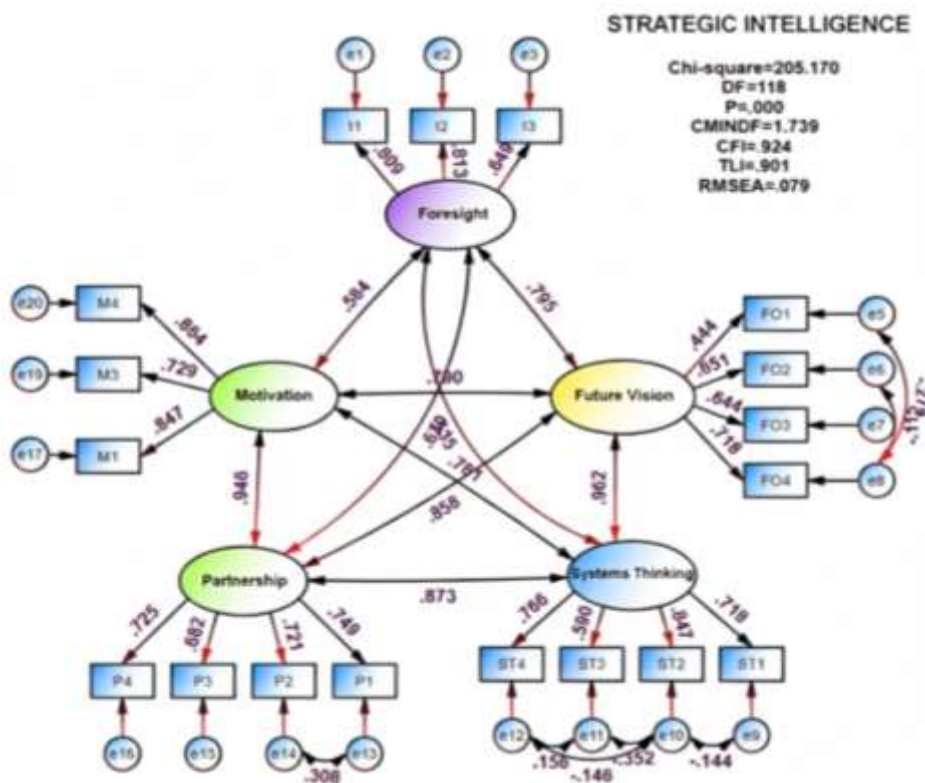
Cronbach's Alpha	Part 1	Value	0.940
		N of Items	25
	Part 2	Value	0.962
		N of Items	25
Total N of Items			50
Correlation Between Forms			0.849
Spearman-Brown Coefficient	Equal Length		0.918
	Unequal Length		0.918
Guttman Split-Half Coefficient			0.915

Source: SPSS V.28 Output

3.5. Statistical Analysis Procedures

The collected data were analyzed using SPSS version 28 and AMOS version 26. Descriptive statistics, including means, standard deviations, and frequencies, were computed to summarize demographic information and study variables. Pearson correlation analysis was conducted to examine the relationships between variables, while multiple regression analysis was employed to test the predictive effects of strategic intelligence and leadership styles on dynamic capabilities. Construct validity was assessed using Confirmatory Factor Analysis (CFA), and reliability was evaluated through Cronbach’s Alpha and split-half reliability. These analytical procedures follow established best practices in quantitative management research, ensuring accuracy, rigor, and replicability of the results.

Figure 1: Confirmatory Factor Analysis of the Strategic Intelligence Variable



Source: AMOS V.26

3.6. Confirmatory Factor Analysis (CFA)

3.6.1. Strategic Intelligence

As shown in Table 4, all items measuring the strategic intelligence variable are statistically significant, with critical ratios (CR) exceeding the 1.96 threshold. These results confirm the significance of the measurement items and indicate that the instrument demonstrates strong construct validity, making it suitable for subsequent analyses (Zabel & O'Brien, 2024).

Table 4: Confirmatory Factor Analysis Indicators for the Strategic Intelligence Variable

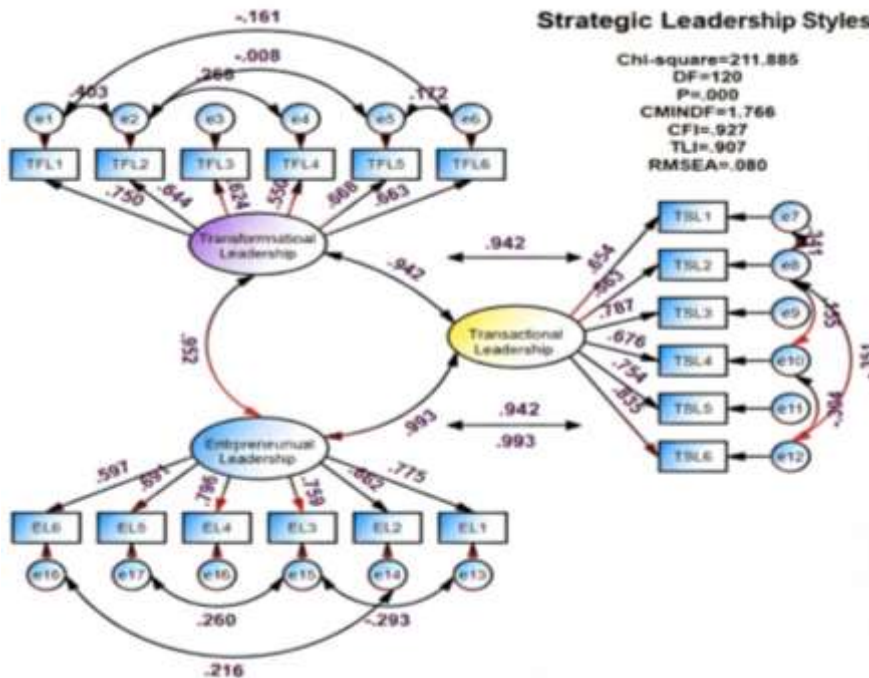
Questions	Path	Dimensions	Estimates	C.R.	P
I1	---->	Insight	.809		
I2	---->		.813	8.646	***
I3	---->		.649	6.941	***
FO1	---->	Future Orientation	.444		
FO2	---->		.651	4.565	***
FO3	---->		.644	4.546	***
FO4	---->		.718	4.314	***
ST1	---->	Systems Thinking	.718		
ST2	---->		.847	8.008	***
ST3	---->		.590	5.912	***
ST4	---->		.766	7.675	***
P1	---->	Partnership	.749		
P2	---->		.721	9.567	***
P3	---->		.682	7.462	***
P4	---->		.725	7.968	***
M1	---->	Motivation	.847		
M3	---->		.729	8.955	***
M4	---->		.864	11.399	***

Source: AMOS V.26

3.6.2. Strategic Leadership Styles

As illustrated in Figure 2 and Table 5, the **strategic leadership styles** variable consists of three dimensions measured through 18 items. The CR values for all items exceeded 1.96, confirming the statistical significance and validity of the items. This demonstrates that the construction is adequately measured and suitable for further analysis.

Figure 2: Confirmatory Factor Analysis of the Strategic Leadership Styles Variable



Source: AMOS V.26

Table 5: Confirmatory Factor Analysis Indicators for the Strategic Leadership Styles Variable

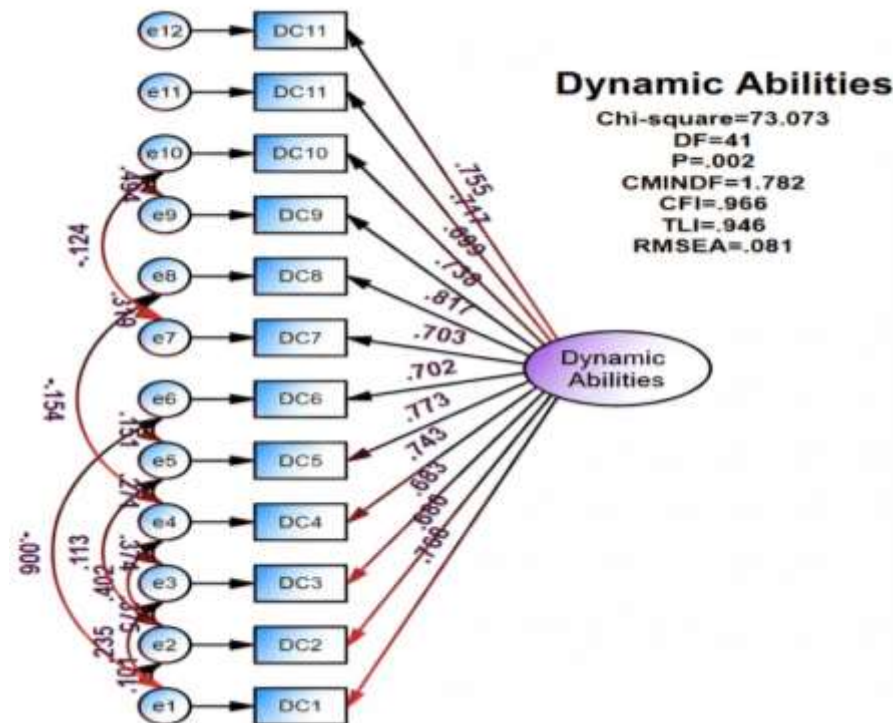
Questions	Path	Dimensions	Estimates	C.R.	P
TFL1	---->	Transformational Leadership	.750		
TFL2	---->		.644	8.793	***
TFL3	---->		.624	6.680	***
TFL4	---->		.550	5.848	***
TFL5	---->		.668	7.164	***
TFL6	---->		.663	6.616	***
TSL1	---->	Transactional Leadership	.654		
TSL2	---->		.663	8.008	***
TSL3	---->		.787	7.563	***
TSL4	---->		.676	6.609	***
TSL5	---->		.754	7.297	***
TSL6	---->		.835	7.905	***
EL1	---->	Entrepreneurial Leadership	.775		
EL2	---->		.662	7.566	***
EL3	---->		.759	7.832	***
EL4	---->		.796	9.442	***
EL5	---->		.691	7.943	***
EL6	---->		.597	6.730	***

Source: AMOS V.26

3.6.3. Dynamic Capabilities

Figure 3 and Table 6 present the dynamic capabilities construct, measured through 12 items. All items are statistically significant, with CR values above 1.96. This confirms the validity of the construct and indicates that the measurement model is appropriate for the study context.

Figure 3: Confirmatory Factor Analysis of the Dynamic Capabilities



Source: AMOS V.26

Table 6: Confirmatory Factor Analysis Indicators for the Dynamic Capabilities Variable

Questions	Path	Dimensions	Estimates	C.R.	P
DC1	--->	Dynamic Capabilities	.768		
DC2	--->		.686	7.989	***
DC3	--->		.683	8.636	***
DC4	--->		.743	8.300	***
DC5	--->		.773	8.727	***
DC6	--->		.702	7.823	***
DC7	--->		.703	7.781	***
DC8	--->		.817	9.299	***
DC9	--->		.738	8.294	***
DC10	--->		.699	7.779	***
DC11	--->		.717	8.039	***
DC12	--->		.755	8.535	***

Source: AMOS V.26

Descriptive Analysis of the Research Variables - The descriptive analysis provides an overview of participants’ perceptions regarding the study variables, comparing public and private banks. Table 7 summarizes the results, including arithmetic means, standard deviations, t-test values, and significance levels.

Strategic Intelligence - The results show that the highest mean for strategic intelligence was observed in the “Senior Management Commitment” dimension within public banks (M = 3.656, SD = 0.679, Good). The lowest mean was observed in private banks (M = 3.423, SD = 0.709, Good). The independent samples t-test indicates no statistically significant differences between public and private banks (t = 1.834, p = 0.069 > 0.05).

Strategic Leadership Styles - For the strategic leadership styles variable, the highest mean was observed in public banks for the “Senior Management Commitment” dimension (M = 3.551, SD = 0.668, Good). The lowest mean was in private banks (M = 3.430, SD = 0.762, Good). The t-test results show no statistically significant differences between public and private banks (t = 1.932, p = 0.353 > 0.05).

3.7. Dynamic Capabilities

The dynamic capabilities variable revealed the highest mean in public banks for the “Senior Management Commitment” dimension (M = 3.449, SD = 0.718, Good) and the lowest in private banks (M = 3.329, SD = 0.819, Moderate). The t-test results indicate no statistically significant differences between public and private banks (t = 0.858, p = 0.393 > 0.05).

The results indicate that, overall:

1. **Construct Validity:** Confirmatory factor analysis demonstrates that all items for strategic intelligence, strategic leadership styles, and dynamic capabilities are valid and significant, meeting the standard CR threshold of 1.96.
2. **Descriptive Insights:** Across all variables, public banks tend to have slightly higher means compared to private banks; however, most differences are **not statistically significant**, suggesting that ownership type does not substantially affect senior and middle management perceptions regarding strategic intelligence, leadership styles, or dynamic capabilities.
3. **Implications:** These results support the reliability and appropriateness of the measurement instruments and provide a solid foundation for subsequent inferential analyses, including correlation and regression analyses to examine relationships among the study variables.

significance threshold of (0.05).

Table 7: Descriptive Statistics of the Research Variables

Research Variables and Dimensions	Ownership Type	N	Mean	Deviation	t	Sig	Decision
Insight	Private	56	3.435	0.928	1.384	0.169	No significant difference
	Public	64	3.651	0.787			
Future Orientation	Private	56	3.558	0.681	1.442	0.152	No significant difference
	Public	64	3.738	0.685			
Systems Thinking	Private	56	3.571	0.824	0.694	0.489	No significant difference
	Public	64	3.676	0.820			
Partnership	Private	56	3.313	0.881	1.929	0.056	

	Public	64	3.613	0.826			No significant difference
Motivation	Private	56	3.238	0.980	2.135	0.035	Significant difference
	Public	64	3.599	0.871			
Strategic Intelligence	Private	56	3.423	0.709	1.834	0.069	No significant difference
	Public	64	3.656	0.679			
Transformational Leadership	Private	56	3.551	0.711	0.864	0.389	No significant difference
	Public	64	3.662	0.693			
Transactional Leadership	Private	56	3.461	0.852	0.760	0.449	No significant difference
	Public	64	3.570	0.719			
Entrepreneurial Leadership	Private	56	3.277	0.883	0.968	0.335	No significant difference
	Public	64	3.422	0.759			
Strategic Leadership Styles	Private	56	3.430	0.762	0.932	0.353	No significant difference
	Public	64	3.551	0.668			
Dynamic Capabilities	Private	56	3.329	0.819	0.858	0.393	No significant difference
	Public	64	3.449	0.718			

Source: AMOS V.26

4. HYPOTHESIS TESTING

4.1. Testing the First Main Hypothesis

Hypothesis: There is a statistically significant effect at the ($\alpha \leq 0.05$) level of strategic intelligence, represented by its dimensions (insight, future orientation, systems thinking, partnership, motivation), on the development of dynamic capabilities in Iraqi banks.

Table 8 demonstrates that the calculated F-value for the relationship between strategic intelligence and dynamic capabilities is 215.941, which exceeds the critical F-value of 3.94 at the 0.05 significance level. This strongly supports the acceptance of the alternative hypothesis, indicating that strategic intelligence exerts a statistically significant effect on dynamic capabilities. Strategic intelligence accounts for approximately 64% of the variance in dynamic capabilities, highlighting its substantial explanatory power.

Moreover, the t-value for strategic intelligence ($t = 14.695$) surpasses the critical t-value of 1.984, confirming the statistical significance of the regression coefficient (β). The β coefficient of 0.880 indicates that a one-unit increase in strategic intelligence corresponds to an 88% increase in dynamic capabilities, illustrating a robust and practically meaningful effect.

Testing the Sub-Hypotheses of Strategic Intelligence Dimensions - The impact of each dimension of strategic intelligence on dynamic capabilities was examined (Table 8). The extracted F-values for the dimensions (insight, future orientation, systems thinking, partnership, motivation) were 40.968, 92.818, 137.405, 162.732, and 120.233, respectively, all surpassing the critical F-value (3.94), confirming statistically significant effects. Accordingly, all sub-hypotheses are supported.

The adjusted R^2 values reveal the variability explained by each dimension: future orientation (62%) exhibits the highest explanatory power, while insight (43%) shows the lowest. Standardized regression coefficients (t-values: 6.401–12.757) exceed the critical value of 1.984, confirming the statistical significance of all β coefficients. The β -values range from 0.453 (insight) to 0.686 (future orientation), indicating that future orientation is the strongest predictor of dynamic capabilities, whereas insight has a comparatively moderate effect.

In the context of Iraqi banks, characterized by environmental volatility, technological evolution, and organizational pressures, strategic intelligence is a pivotal capability. Each dimension equips leadership with tools for strategic foresight, resource optimization, and rapid adaptation. Consequently, activating these dimensions is essential for fostering dynamic capabilities. These findings underscore that investing in strategic intelligence development is critical for enhancing institutional resilience, innovation, and sustainable competitive advantage.

Table 8: Analysis of the Impact of Strategic Intelligence Dimensions on Dynamic Capabilities

Dependent Variable	Dimensions of the Strategic Intelligence Variable		(R^2)	Adj (R^2)	(F)	(t)	Sig	
		(α)						
Dynamic Capabilities	Insight	(α)	1.785	0.258	0.251	40.968	6.401	0.000
		(β)	0.453					
	Future Orientation	(α)	0.686	0.440	0.436	92.818	9.634	0.000

	(β)	0.741						
Systems Thinking	(α)	0.908	0.538	0.534	137.405	11.722	0.000	
	(β)	0.685						
Partnership	(α)	1.042	0.580	0.576	162.732	12.757	0.000	
	(β)	0.677						
Motivation	(α)	1.401	0.505	0.500	120.233	10.965	0.000	
	(β)	0.581						
Strategic Intelligence	(α)	0.272	0.647	0.644	215.941	14.695	0.000	
	(β)	0.880						

Source: SPSS V.28 Output

4.2. Testing the Second Main Hypothesis

Hypothesis: There is a statistically significant effect at the ($\alpha \leq 0.05$) level of strategic leadership styles, represented by transformational, transactional, and entrepreneurial leadership, on the development of dynamic capabilities in Iraqi banks.

Table 9 shows that the calculated F-value for the overall effect of strategic leadership styles on dynamic capabilities is 325.500, exceeding the critical F-value of 3.94 at the 0.05 significance level. This strongly supports the alternative hypothesis. Strategic leadership styles explain 73% of the variance in dynamic capabilities. The t-value of 18.042 confirms the statistical significance of the β coefficient, with a β -value of 0.920, indicating that a one-unit increase in strategic leadership styles is associated with a 92% increase in dynamic capabilities.

Testing the Sub-Hypotheses of Strategic Leadership Styles - The F-values for the dimensions (transformational, transactional, entrepreneurial leadership) were 138.871, 197.586, and 315.819, respectively, confirming the significant effect of each leadership dimension. Adjusted R² values ranged from 0.537 to 0.726, with transactional leadership showing the highest explanatory power (62%) and transformational leadership the lowest (43%).

t-values for regression coefficients (11.784–17.771) exceeded the critical t-value of 1.984, confirming the statistical significance of all β coefficients. The β -values ranged from 0.775 (transactional leadership) to 0.804 (transformational leadership), illustrating that transformational leadership has the strongest impact on dynamic capabilities.

In Iraq’s challenging banking environment, characterized by regulatory pressures, market fluctuations, and technological advancements, strategic leadership is essential for organizational adaptability. Effective leadership cultivates a culture of innovation, accountability, and resilience. Therefore, investing in strategic leadership development is crucial to strengthen dynamic capabilities and maintain competitive advantage.

Table 9: Analysis of the Impact of Strategic Leadership Styles Dimensions on Dynamic Capabilities

Dependent Variable	Dimensions of the Strategic Leadership Styles		(R ²)	Adj (R ²)	(F)	(t)	Sig	
Dynamic Capabilities	Transformational Leadership	(α)	0.490	0.541	0.537	138.871	11.784	0.000
		(β)	0.804					
	Transactional Leadership	(α)	0.667	0.626	0.623	197.586	14.057	0.000
		(β)	0.775					
	Entrepreneurial Leadership	(α)	0.715	0.728	0.726	315.819	17.771	0.000
		(β)	0.798					
	Strategic Leadership Styles	(α)	0.177	0.734	0.732	325.500	18.042	0.000
		(β)	0.920					

Source: SPSS V.28 Output

4.3. Testing the Third Main Hypothesis

The third main hypothesis proposed that strategic intelligence and strategic leadership styles jointly exert a statistically significant effect on the development of dynamic capabilities in Iraqi banks. The multiple regression model was estimated as follows: Dynamic Capabilities = -0.133 + 0.371 (Strategic Intelligence) + 0.633(Strategic Leadership Styles) \ \text {Dynamic Capabilities} = -0.133 + 0.371 (\text {Strategic Intelligence}) + 0.633 (\text {Strategic Leadership Styles} Dynamic Capabilities = -0.133+0.371 (Strategic Intelligence) + 0.633 (Strategic Leadership Styles)

As presented in Table 10 and Figure 4, the model’s F-value of 203.882 exceeds the critical value of 3.94 ($\alpha \leq 0.05$), confirming the joint statistical significance of strategic intelligence and leadership styles. The model explains 77% of the variance in dynamic capabilities (adjusted R² = 0.773), indicating a high predictive power.

The regression coefficients show that a one-unit increase in strategic intelligence is associated with a 37% increase in dynamic capabilities, whereas a one-unit increase in strategic leadership styles results in a 63% increase. These results suggest that while both factors significantly influence dynamic capabilities, strategic leadership styles exert a relatively stronger effect, highlighting their critical role in enhancing organizational adaptability and performance in the banking sector.

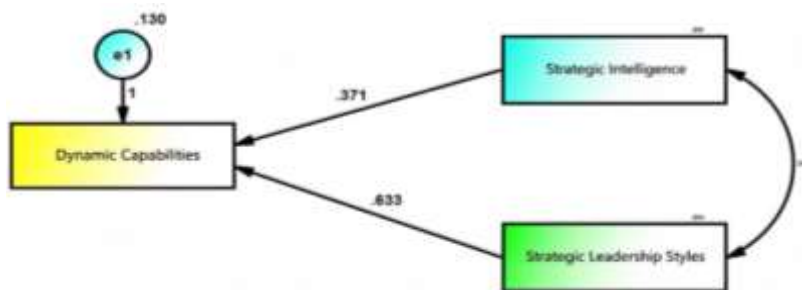
Table 10 presents the results of the regression analysis examining the impact of strategic intelligence and strategic leadership styles on dynamic capabilities in Iraqi banks. The results indicate that strategic intelligence has a statistically significant effect on dynamic capabilities, with a standardized coefficient ($\beta = 0.371$), a t-value of 4.756, and a significance level of ($p < 0.001$). This finding suggests that higher levels of strategic intelligence enhance banks' ability to sense environmental changes, anticipate future trends, and support adaptive organizational responses. Similarly, strategic leadership styles demonstrate a strong and statistically significant effect on dynamic capabilities, as reflected by a higher standardized coefficient ($\beta = 0.633$), a t-value of 8.272, and a significance level of ($p < 0.001$). This result indicates that leadership behaviors play a critical role in translating strategic insights into effective decision-making, resource reconfiguration, and organizational flexibility. The overall model is statistically significant, with an F-value of 203.882 at a significance level of ($p < 0.001$), confirming the adequacy of the regression model. Correlation coefficient ($R = 0.882$) indicates a strong relationship between independent variables and dynamic capabilities. Moreover, the coefficient of determination ($R^2 = 0.777$) reveals that approximately 77.7% of the variance in dynamic capabilities is explained by strategic intelligence and strategic leadership styles, while the adjusted R^2 value (0.773) confirms the robustness and stability of the model. Overall, these results provide strong empirical support for the study hypothesis, demonstrating that the integration of strategic intelligence with effective leadership styles significantly enhances dynamic capabilities in Iraqi banks.

Table 10: The Impact of Strategic Intelligence and Strategic Leadership Styles on Dynamic Capabilities

Dependent Variable	Path	Independent and Mediator Variables	(α)	(β)	t	SIG	F	SIG	(R)	(R^2)	Adj (R^2)
Dynamic Capabilities	--->	Strategic Intelligence	0.133-	0.371	4.756	0.000	203.882	0.000	0.882	0.777	0.773
	--->	Strategic Leadership Styles		.6330	8.272	.0000					

Source: Amos V.25 Output

Figure 4: The Impact of Strategic Intelligence and Strategic Leadership Styles on Dynamic Capabilities



Source: Amos V.25 Output

5. CONCLUSIONS AND PRACTICAL IMPLICATIONS

The results indicate that Iraqi banks can significantly enhance their dynamic capabilities by strategically developing leadership and intelligence competencies. Strategic intelligence fosters foresight, adaptability, and effective problem-solving, while strategic leadership ensures sound decision-making, motivation, and organizational alignment. The synergy between these factors is essential for innovation, agility, and sustainable competitive advantage in the complex and rapidly evolving banking sector. The study confirmed the validity and reliability of the measurement instruments through Confirmatory Factor Analysis (CFA), with all items exhibiting significant loadings and critical ratios exceeding the 1.96 threshold, demonstrating strong construct validity. Descriptive analyses showed that public banks generally scored higher than private banks on strategic intelligence, leadership styles, and dynamic capabilities, although most differences were not statistically significant. This suggests that ownership type does not markedly influence managerial perceptions regarding these organizational capabilities.

Correlation analysis revealed positive and significant relationships among strategic intelligence, leadership styles, and dynamic capabilities, indicating that higher levels of strategic intelligence support more effective leadership, which in turn enhances dynamic capabilities. Multiple regression analysis further demonstrated that both strategic intelligence and strategic leadership styles significantly predict dynamic capabilities, jointly explaining 56.8% of the variance. These findings underscore that developing strategic intelligence and fostering effective leadership are key drivers of organizational adaptability and

performance.

5.1. Practical Implications

The study offers actionable recommendations for banking practitioners. Banks should invest in systematic intelligence-gathering, scenario planning, and knowledge management to strengthen decision-making. Leadership development programs focusing on transformational, transactional, and entrepreneurial styles can enhance proactive and innovative responses to market changes. Additionally, developing sensing, seizing, and reconfiguring capabilities—integrated with strategic intelligence and leadership practices—will enable organizations to respond effectively to environmental changes. Regulators and policymakers can further support these efforts by promoting organizational learning, knowledge sharing, and leadership development initiatives to enhance sector-wide agility and competitiveness.

5.2. Theoretical Contributions

This research confirms the critical role of strategic intelligence and leadership styles in enhancing dynamic capabilities, supporting the dynamic capabilities framework (Zabel & O'Brien, 2024). It extends the literature by providing empirical evidence from the banking sector and demonstrates how integrated organizational practices influence adaptability and competitive advantage. By combining intelligence, leadership, and dynamic capabilities in a single framework, the study offers a comprehensive model for future research in strategic management.

5.3. Recommendations for Future Research

Future studies may expand across other sectors, such as insurance, fintech, or manufacturing, to generalize these findings. Longitudinal studies are recommended to examine the long-term effects of strategic intelligence and leadership practices on dynamic capabilities. Additionally, exploring moderating variables such as organizational culture or technology adoption, and mediating variables such as innovation capability, can provide further insights into the mechanisms influencing dynamic capabilities. In conclusion, developing strategic intelligence and fostering effective leadership are critical enablers for enhancing dynamic capabilities in banking organizations, thereby supporting sustainable competitive advantage and organizational resilience.

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Appendix: Research Questionnaire

Subject: Research Questionnaire Completion

Dear Employees of (Insert Bank Name),

The researchers are conducting a study titled: "The Interaction of Strategic Intelligence and Strategic Leadership Styles in Developing Organizational Dynamic Capabilities: A Case Study of (Insert Bank Name)."

This study is conducted for scientific research purposes. We kindly request you to answer all the items in this questionnaire objectively. Your responses will significantly contribute to the success of this study. We assure you that all collected data will be treated with strict confidentiality and used for research purposes only.

Thank you for your cooperation and valuable time.

Part One: Demographic Data

Please place an (X) in the appropriate box:

- Gender: Male Female
- Educational Qualification: Diploma or less Bachelor’s Postgraduate
- Age Group:
 1. Less than 30 years.
 2. 30 to less than 40 years.
 3. 40 to less than 50 years.
 4. 50 years and above.
- Years of Experience:
 1. Less than 5 years.
 2. 5 – 10 years.
 3. 10 – 15 years.
 4. 15 years and above.
- Bank Ownership: Government Private

Part Two: Study Variables

Please rate the following items using the 5-point Likert scale:

(5: Strongly Agree, 4: Agree, 3: Neutral, 2: Disagree, 1: Strongly Disagree)

No.	Item	5	4	3	2	1
First:	Strategic Intelligence					
1.	Insight					
1	The bank management conducts environmental scanning to identify opportunities and threats.					
2	The bank management listens effectively to customer needs.					
3	The management monitors future indicators to anticipate changes.					
4	The management develops scenarios for potential future events.					
2.	Future Orientation					

No.	Item	5	4	3	2	1
1	The bank management sets a unique and clear future vision.					
2	The bank exploits strategic opportunities at the right time.					
3	The bank identifies the core competencies needed to implement its vision.					
4	The management develops clear plans to achieve its strategic vision.					
3. Systems Thinking						
1	Management considers the impact of decisions on the entire organization.					
2	There is high interaction and coordination between different departments.					
3	Management fosters teamwork skills to achieve common goals.					
4	Decisions are aligned with the overall strategic objectives of the bank.					
4. Partnership						
1	The bank builds strategic alliances to strengthen its market position.					
2	Partnerships are used to address internal organizational weaknesses.					
3	The bank maintains a realistic understanding of market dynamics through partners.					
4	Strategic partnerships are based on mutual benefits and long-term value.					
5. Motivation						
1	The bank empowers employees to improve work quality and performance.					
2	Management shows appreciation for individual and collective contributions.					
3	Employee roles are clearly aligned with the bank's strategic goals.					
4	Management provides incentives that encourage innovative behavior.					

No.	Item	5	4	3	2	1
Second: Strategic Leadership Styles						
1. Transformational Leadership						
1	Management encourages professional growth and continuous learning.					
2	Leaders share successful experiences with their subordinates.					
3	Management fosters an environment of mutual respect and trust.					
4	Leaders support the personal and professional needs of employees.					
5	Management encourages the generation of innovative and creative ideas.					
6	Management focuses on continuous administrative development.					
2. Transactional Leadership						
1	Management emphasizes perseverance in achieving work goals.					
2	Leaders set clear goals and expectations for every task.					
3	Management focuses on identifying and correcting errors promptly.					
4	Management grants necessary authority to employees to perform their duties.					
5	Leaders hold responsibility for errors while providing solutions.					
6	Management ensures all work requirements are provided.					
3. Entrepreneurial Leadership						

No.	Item	5	4	3	2	1
1	Management demonstrates a high awareness of the importance of timing.					
2	The bank is committed to providing high-quality innovative services.					
3	Management utilizes modern communication methods to inspire the workforce.					
4	Management encourages inspiration and creativity among employees.					
5	The bank sets service costs using scientific methods.					
6	Leaders maintain high credibility in their interactions with employees.					

No.	Item	5	4	3	2	1
Third: Dynamic Capabilities (Dependent Variable)						
1	The bank reviews its service efforts to ensure they match customer desires.					
2	Management allocates sufficient time for developing new service ideas.					
3	The bank conducts regular environmental scanning to discover new business opportunities.					
4	The bank excels at transforming raw information into new organizational knowledge.					
5	Management actively converts knowledge into innovative new services.					
6	The bank demonstrates high flexibility in adapting to changing work conditions.					
7	Management evaluates performance based on specific organizational procedures.					
8	Management reconfigures organizational resources to meet market demands.					
9	The bank ensures optimal utilization of its existing assets and resources.					
10	The bank coordinates its resources effectively across all departments.					

CHIEF EXECUTIVE OFFICER (CEO) SYSTEMATIC BELIEFS AS A CONTINUAL IMPROVEMENT BACKGROUND SUPPLEMENT FOR PROSPERING AN ORGANIZATION: A NON-STOP PDCA LOOP

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ABSTRACT

Purpose- Nowadays, organizations play a vital and indispensable role around the world in any society. Generally speaking, they are particularly to make products or services for their customers. It is obvious that each organization consists of two main aspects including human resources and physical infrastructure. Human resources would be defined as the soul of each organization for which they are making decisions and more importantly running the strategy. Human resources must be inherently directed and managed to the right course of actions. Additionally, the known and unknown interactions between the human resource's behavior and the manager's beliefs will influence decisions and determine the reflection and satisfaction of human resource motivation. Consequently, top leaders of an organization must be inevitably assured that everything is adequately positioned structurally and behaviorally in a typical organization. In this research, besides the overview of the previous studies, it is intended to offer a novel empirical model for making better sense of the chief executive officer role for prospering his/her under controlled organization.

Methodology- The research on which this article is based derives from prior related papers. So, extensive literature research has been done in order to increase our understanding of leadership and systematic belief as well as the relationship between these two concepts.

Findings- The main contribution of this article is to present a dynamic empirical model based on the beliefs of chief executive officer to hatch endlessly different minded attempts for continual improvement. Particularly those skills that persuade the organization as a whole are proposed to manage by chief executive officer for real continual improvement.

Conclusion- Shapeless complexity and system thinking are the two main combined aspects that let us manipulate CEO's beliefs toward the directed goals by an endless improvement paradigm. Contrary to the iceberg model CEOB paradigm attempts to make a mental bridge to show CEO's beliefs which can be seen anytime and anywhere.

Keywords: Chief executive officer, leadership, system thinking, complexity, beliefs.

JEL Codes: D23, J53, M12

1. INTRODUCTION AND LITRATURE REVIEW

In today's increasingly globalised, chaotic, turmoil of economy and changing world, the main role of a leader is to motivate and inspire people to create, innovate, and contribute their greatest potential to their work, organizations and communities. It has just been decided to discuss the organization which is described as a group of people engaged in a common enterprise (Bennis & Nanus, 1985). Clearly, the chief executive officer, like a leader known as the CEO in the management context, plays the most important role in an organization. According to upper echelons theory, CEOs are explicitly the most powerful and also the main decision makers in their organization, hence their personality, preferences and leadership style will have profound influence on the organization they lead (Hambrick, 2007); Hambrick & Mason, 1984). A key CEO role is to sell the strategy and shape how analysts and shareholders look at the company (Porteret et al.,(2004)). The word leadership has been described in terms of the position, personality, responsibility, influence process, instrument to achieve a goal and behaviors (Limsila & Ogunlana, 2007). CEO's influential situation and high ranked position at organization's hierarchy level can provide different kinds of processing the business models in a volatile sophisticated atmosphere. It has been found that the higher one's position in the organization's hierarchy, the greater impact it has on organizational performance (Gerhart & Milkovich, 1988). On the other hand, CEO will specifically manipulate the organization's performance and coach the board of directors who are ultimately responsible for making sure the organization's goals are effective and efficient at the utmost level. Moreover, CEO must sustain the organization's culture, values, performance and his/her leadership system to develop the organization's reputation to keep its position in the front line of competition. Leaders clearly describe the vision of the organization; the values and beliefs that are the foundations for the vision; actively engage employees in discussions and activities promoting et al., (commitment to foundational beliefs,

values, sense of purpose, and desired performance; and depict a future that is credible, realistic, attractive, inspiring, and better than the status quo (O'Connell et al.,(2010)). The CEO is uniquely positioned to ensure that a company's purpose, values, and standards are relevant for the present and future and for the businesses the company is in (Lafley, 2009). Values inform the application of leadership qualities as the competencies of leadership are activated – learned, developed, and practiced within the set of core values (Keyser(2011)). CEOs as leaders are therefore expected to be efficient and effective leaders with significant impact on the performance of the organizations, they lead (Boatright, 2009). Strictly speaking, these are almost an overall view of CEO's functions which cannot be exactly measured or scaled mathematically. It is because it is intended to define some characters combined with complexity and ambiguity features. Leadership performance has always been difficult to measure as objective criteria are often absent (Murensky, 2000). These non-stochastic essences of the problem associated with CEO's performance would lead us to the challenge of how much the extent of CEO's role is and furthermore how can CEO possibly spread out his/her beliefs to the subordinate employees? It is ambiguous to the extent that the role is still uncertain and remains unsubstantiated by empirical research (Edersheim, 2007; Hales, 1986; Lafley, 2009).

More importantly, there is a question left unanswered comprehensively and that is how CEO can overall scrutinize the organization's effectiveness, level of performance and also evaluating board of directors. It seems that this is the bottleneck point when emerging the CEO's role variations. Thus, it should be considered that CEO will have faced uncertainty and hereby he/she morally must have an acumen propensity to feel everything is all in the right positions. About the beliefs, a CEO usually shows his/her opinions as a formal statement in the organization's policy and the associative strategies being related to organization's mission and vision. Beliefs are defined here as understandings about credible relationships between objects, properties, or ideas (Colby, 1973; Sproull, 1981). About the vision, "we think of outstanding achievement. We think of deeply held values that bond achievement. We think of deeply held values that bond people in a society together. We think of audacious, exhilarating goals that galvanize people. We think of something eternal—the underlying reasons for an organization's existence. We think of something that reaches inside us and pulls out our best efforts" (Colins& Porras, Built to Last, p. 475). Although there have been always written smart goals, policies, vision and strategies which compromised with employees, they all have the qualitative aspects in which the flourishing and better performance would correspondingly designate to CEO's role and vice versa the unpleasant and undesirable outcome too. Despite all, the leadership role is believed to be one of the most important roles of a CEO with a reach that spans all other roles. This belief makes a brief description of leadership theories necessary for informing research on CEOs (Goleman et al.,2002; Mintzberg, 1973; Steiner et al.,1981). Generally, leadership as a key-term in managerial contexts is apparently stated due to directing a group towards a goal. This group can be called manpower in an organization. Manpower is the most strategic factor in increasing the efficiency and the level of development in organizations (Koc, 2010; Alavi et al.,2013); Koc et al.,2014).

Thus, there are several vital concepts ontologically shaped in directing an organization as a whole system to work for identifying goals. These concepts can comprise leadership styles, making strategies, creating values, organization's culture, organization's structure, organizational commitment and many other related topics. All these already mentioned words are inherently based on the CEO's vision and the way of strategic thinking. Specifically, a top manager of an organization known as a CEO will have major responsibility to settle down all things needed to implement effective tactics to meet the organization's mission. Bennis has said that "leadership is the capacity to translate vision into reality"(1991:34). Moreover, it is also confirmed that the mental attitude or the thinking approach of a CEO has an overwhelmingly inspiring effect on organization's employees. Inspiration is defined as inspiring and empowering employees to enthusiastically accept and pursue the CEO's challenging strategic goals and the organization's mission. Besides, an attitude is a psychological state of mind. It is the way a person thinks about situations, and it ultimately determines a person's behavior. Briefly speaking, an effective organization requires both tactical and strategic thinking as well as cultural building by its leaders. As a matter of fact, from what makes sense that attitudes and beliefs would guide behavior and if it is going to tend to assume that people behave according to their attitudes then CEO's beliefs shape the realities which contribute to organization's performance. Consequently, leadership is a belief which is mainly connected to CEO's role of management. Actually, organization's vision model gets its roots from the top manager's beliefs. This issue may also be taken into account the stimulus of much research which has been done about the leadership aspects, the leader's style of management and the manager's beliefs. In fact, there are now too many studies which investigate and discussed around the different features of management ideas and either the relationship studies among the impact of organizational beliefs and managerial vision. Donaldson & Lorsch (1983) by their extensive research revealed that "beliefs and corporate strategy are closely intertwined. Bennis& Nanus (1985); Tichy& Devanna (1986); House (1977); and Burns (1978), when they worked on different aspects of leadership, were the first authors who really focused on managerial vision. Besides, there are several practical analyses which have resulted in that CEO's vision is the key to leadership (Korn & Ferry, 1989; Robertson & Walt, 1999). Moreover, there are also some empirical contributions on proofing the positive effects of vision on venture growth (Baum, Locke & Kirkpatrick, 1998). Furthermore, there has also been some structural research specially focusing on the effects of leadership visions with business growth and organization's performance. Barling et al., (1996) and Howell & Avolio (1993) explored the significant relationships between leadership styles and business performance of an organization. Some other investigators have reported suggestions about how the leaders shall share their points of view and beliefs stated in organization's vision to followers. House

(1977) stresses that leaders who communicate and make links their vision to employees would affect the organization's outcomes. Bennis & Nanus (1985) argued the significance of accepting and supporting the organization's vision by communicating it by leaders in a variety of ways, both in writing and orally. Bass (1985) and Tichy & Devanna (1986) expressed about the importance of the leader's vision which must be communicated with all staff through some speeches or pep talks. Kouzes & Posner (1987) also talked about vision communication all over the organization in order to convince all people to support it. About the inevitable influence of CEO's beliefs on firm's strategies, there has been correspondent research made by Day & Lord (1992); Priem (1994); Thomas et al., (1993). They all strongly verified that CEO's beliefs have substantial effects on strategic plans and actions. Additionally, there are many studies in which the effect of CEO's beliefs on strategic processes has been tested before. Earlier in time, Hage & Dewar (1972) declared that CEOs who believed in the value of change management would cause the organization to be more innovative. Narayanan & Fahey (1990) also found relevantly that CEO's beliefs concerning which factors might affect sales and profits would be different in a successful and unsuccessful manufacturing firm of the same industry. Besides there are other past studies done by D'Aveni & MacMillan (1990); Fiol (1989); Gioia & Chittipeddi (1991); Priem (1994) and Walsh et al., (1988) that connect the CEO's beliefs to organizational processes. Particularly, Walsh (1995) discussed the influence of CEO's beliefs on organizational processes. If it is overall looked attentively at the factors impacting on CEO's beliefs, then there can be some systematic investigations found in which those factors have been discussed by Ginsberg (1989); Gray et al., (1985); Hambrick & Mason (1984) and Harris (1994). These studies dedicated to empirically getting closer approach to factors influencing the CEO's beliefs were followed by Hambrick et al., (1993); Hauenstein & Foti (1989); Ireland et al., (1987); Lurigo & Carroll (1985); Markoczy (1997); Stewart & Latham (1980); Walker (1985); Walsh (1988). Added support for the importance of leader's belief comes from Chattopadhyay et al., (1999). In distinguishable research they focused vastly on the determinants of the executive beliefs. They psychologically proposed a more comprehensive research analysis to compare the validity of two sets of arguments about the determinants of CEO's beliefs regarding factors affecting organizational effectiveness. Methodologically, in their work, some hypothesis about the strength of relationship between the beliefs of same positioned executives and further the relationship between the CEO's beliefs and their functional background have been tested.

Thus far, to assess the previous studies mentioned clearly, they were all examining the inclination and covariance propensity argument of CEO's beliefs due to organizational performance, management styles, organizational effectiveness, organization's strategic plan and business growth. Emphatically, they documented significant correlations between leadership's belief facets and organizational functions. Now, it is time to purposefully review the studies for which the CEO's beliefs are behaviorally related to different features of organizational functions. One of the most profound investigations has been done by Van den Steen (2001). He applied a distinct approach to the interaction between managerial vision and organizational performance. He specially exploited a game model to evaluate the profitability of vision in an economic paradigm. Vision, in his paper, is defined operationally as a very strong belief by the manager about the future and about the right course of employee actions and the manager's decisions to pay the wages. The basic constituent part of his model is the presence of uncertainty about which organization's projects will be economically successful and generate revenue for the firm. Finally, the analysis proofs that the CEO's vision and the employee's beliefs play an economically valuable role in the firm's outcome. In another work, Baum et al., 1998 reported a positive effect of CEO's vision and beliefs on venture growth of an organization. About the CEO's vision communication, there are some studies which stressed the importance of communicating the vision. Conger & Kanungo (1987) as well as Locke et al., (1991) in similar works, pointed out that leaders should deploy both their personal communication skills, including speaking as well as listening skills, to articulate the vision to followers in an organization. Finally, if it is considered an organization as such representation as a complex social system, then there have been many substantial bodies of research emphasizing the importance of system approach applying in an organizational context. Fundamentally, this conceptual approach has originated from situation in which the organizations are today characterized by a high level of complexity both structural and of the organizational behavior just associated with those people who have interactions in such an intricate structure. The main founders of systematic methodology used in management science, Forrester (1975); Ackoff (1999); Senge (1990), (2003) look attentively at organizations as an open socio-cultural system. Churchmann (1979); Checkland (1981); Warren (2000); Capra (2002) and Laszlo (2002) also used the system to think practical values in management studies. Other principles, such as Haines (1998); Richmond (2001); Gharajedaghi (2006) established new methods to implement the system thinking laws in management processes. Richmond (2001) in his meticulous book, defined thinking as consisting of two activities: constructing mental models and then simulating them in order to draw conclusions and make decisions. He then tried to present some detailed mental models to show the constructing and simulating phases of system thinking at learning process. Gharajedaghi (2006) discussed the three models to successively convey the understanding of organizational nature from a mindless mechanical tool to a uni-minded biological being and, finally, to a multi-minded organized complexity. Specifically, the systems for which he analyzed methodically are information bonded. Palaima & Skarzauskiene (2010) in empirical research revealed and delineated that the various dimensions of system thinking have statistically the most important effect on the top executive's performance, especially in the industrial organizations.

More importantly, in today's highly interconnected, volatile, and technology-driven environment, organizations face unprecedented levels of uncertainty and turmoil, competitive pressure, and socio-technical complexity. As firms operate in global

ecosystems marked by rapid digital transformation, geopolitical turbulence, and shifting workforce expectations, the role of organizational leadership particularly the Chief Executive Officer (CEO) has become increasingly consequential. Modern organizations are no longer defined solely by their structures, strategies, or resources, but by the behaviors, beliefs, and cognitive orientations of the individuals who guide them (Zhu et al.,2020). Consequently, the CEO, who stands at the apex of the strategic leadership hierarchy, plays a uniquely influential role in shaping organizational direction, culture, adaptability, and long-term performance.

Building upon the foundations of upper echelons theory, recent research continues to confirm that CEOs' psychological traits, values, and belief systems systematically influence organizational outcomes (Wang et al.,2021). CEO cognition—including how leaders interpret environmental cues, prioritize strategic issues, and frame organizational challenges—has been identified as a major determinant of strategic actions, innovation capabilities, sustainability initiatives, and stakeholder relationships (Li et al.,2022). As CEOs are expected to navigate complex environments, their ability to articulate a credible strategic vision and inspire diverse stakeholders remains essential for collective alignment and organizational resilience (Cao et al.,2023).

Leadership today is widely recognized not merely as a positional authority but as a dynamic influence process grounded in shared values, relational engagement, and emergent sense-making. Recent work shows that effective CEOs deliberately foster meaning, purpose, and psychological coherence across the organization, reinforcing cultural norms and shared mental models that sustain performance (Hannah et al.,2021). These leaders integrate emotional intelligence, authenticity, and value-driven decision-making to cultivate environments that motivate employees and enhance commitment, creativity, and well-being (Newman et al.,(2023)). As organizations become more people-centric, human beliefs and values exert a stronger influence on collective behavior and strategic execution.

At the same time, measuring CEO performance remains inherently challenging. Newer empirical studies highlight the difficulty in capturing the qualitative and intangible nature of leadership influence, especially as CEO behaviors increasingly interact with multifaceted organizational systems (Javed et al.,2022). Research continues to show that many aspects of CEO impact, including belief transmission, cultural imprinting, strategic framing, and systems leadership—cannot be fully quantified, yet they remain crucial for organizational success. The ambiguity surrounding CEO effect size persists, but evidence increasingly points to the significant role of CEO beliefs in shaping organizational trajectories, particularly in turbulent environments (Zhang & Zhu, 2023).

CEO beliefs are now understood as cognitive schemas that guide interpretations of organizational challenges, influence risk-taking tendencies, and shape strategic preferences. Beliefs act as mental models through which leaders define success, allocate resources, communicate priorities, and set behavioral expectations for employees. Recent studies show that CEO belief systems strongly influence organizational learning, digital transformation, sustainability orientation, and the adoption of innovative practices (Crilly et al., (2022)). In many cases, the clarity and communicability of the CEO's vision determine whether employees internalize strategic objectives and engage in synergistic behaviors that support high-level goals (Berson & Peiró, 2020).

From a systems perspective, leading organizations are increasingly described as complex adaptive systems whose performance depends on continuous alignment among interdependent components—people, processes, technology, and culture. Contemporary systems thinking research emphasizes the CEO's role in navigating nonlinear interactions, fostering organizational learning, and creating conditions that sustain adaptability and resilience (Dyer & Ericksen, 2021). As environmental complexity escalates, system thinking has emerged as a core leadership capability allowing CEOs to understand whole-system dynamics, identify leverage points, and foster self-reinforcing improvements throughout the organization (Haque & Aston, 2022).

Despite extensive work on leadership, CEO beliefs, and organizational systems, recent scholars note that little attention has been given to how CEOs can behaviorally transmit their beliefs throughout the organization in a consistent and systematic manner. Specifically, the question of how CEO beliefs can be operationalized as a continuous, organization-wide improvement mechanism remains insufficiently explored. Much of the current literature identifies the importance of CEO cognition but does not provide a behavioral model describing how these beliefs can be embedded into the organizational context, sensed by employees, and manifested in everyday decision-making.

This gap motivates the present study, which seeks to develop a conceptual framework that links CEO systematic beliefs with continuous organizational improvement. As organizations increasingly require leaders who can shape meaning, manage complexity, and catalyze adaptive behaviors, it becomes essential to articulate a mechanism through which CEO beliefs can permeate organizational systems. This study therefore proposes a dynamic, process-based model—rooted in systems thinking and continuous improvement—to illustrate how CEO beliefs can function as an ever-present, guiding force throughout the organizational environment.

In sum, as previously mentioned, the influence of leadership way of thinking, CEO's values and beliefs has been widely applied and validated in past research. Moreover, since they are nearly all studies which are emphasizing to indicate the factors determining the multi-dimensions features of executives' beliefs; certainly, they ultimately will strengthen our base knowledge

whilst erupting the aspiration that goes for further investigations. But thoughtfully, there was no evidence showing how the CEO's behavioral attempts can pave the way which may retain all the organization non conflicting goals systematically. In case of this point of view, it is now proposed to a new study about how CEO's systematic belief might influence employee behavior and how leadership values will go thoroughly into the organization atmosphere to liquefy and be pandemic material everywhere and every time.

2.METHODOLOGY, STUDY PURPOSE AND SIGNIFICANCE

The research on which this article is based derives from prior related papers. So, extensive literature research has been done in order to increase our understanding of leadership and systematic belief as well as the relationship between these two concepts.

The context of the world in which people do manage an organization has changed dramatically, thus something is left with a substantial gap in our theory about the CEO's beliefs of how to direct and how to spend his/her time. Hambrick & Finkelstein (1987) theorized that many chief executives do not have a great deal of direct control over broad organizational features such as organizational culture. Moreover, it is also being a problematic issue that how CEO's may feel to generalize his/her visions along with the organization's staff. Perhaps, there is almost a dispute about what model rhetorically reflects the meaningful alignment between the top senior management role of behavior exerting on the organization and way of employee's performance. Since it has been intentionally interested in the link between CEO's beliefs and organization's propensity to thrive, the leader's beliefs about how they will contribute to their leadership and also influence the organization's performance will be elicited. The primary impetus for this interest is to commence a real-practical paradigm for sketching some procedural manifest in order to smoothly make that CEO's systematic beliefs and his/her vision liquefy everywhere and every time in an organization. Besides, in authentic material, Ospina & Sorenson (2007) viewed leadership as a dynamic, collective and community-based achievement. These core foundations would be predominant and prevailing assumptions and a conceptual entity by which the existing investigation is rested on.

3.THE LEADERSHIP'SBELIEFS, CEO's VALUES AND SYSTEM THINKING APPROACH TO DESIGN A SHAPELESS PROCESS OF CEOB

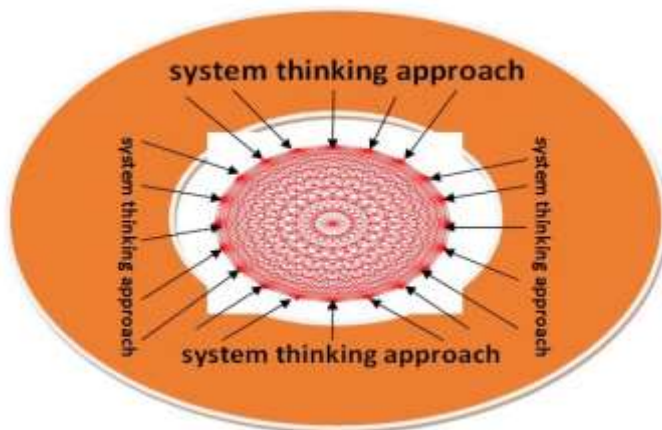
A person's value set includes his or her beliefs regarding acceptable modes of conduct in particular situations, acting as principles which guide behaviors. A CEO's values and beliefs set the stage for the culture of the organization, which in turn influences its growth, efficiency, and member behavior. Through the strategic decisions they make, CEOs impress their values and beliefs upon the culture of the organization. On the other hand, it is required that the CEO's in such an organization of nonlinear dynamic complexity to be system thinker for making effective decisions (Sterman, 2000). This main issue distinguishably inherits from transferring the organization as a mechanical machine paradigm to the ones as a biological model, even the socio-cultural models. This point of view originated and got its roots from the system theory described by Ludwig von Bertalanffy (1969). The primary goal in developing systems theory was to provide a useful framework for describing a broad range of systems using the same terminology, in contrast to existing discipline-specific systems models in biology, engineering, and psychology (Bertalanffy, 1940). System thinking involves a broader view, looking at larger numbers of interactions and that creates a better understanding of the big picture (Ackoff, 1999). The systems thinking concept is based on the systems philosophy and states that any human activity is open systems affected by the environment (Vickers, 1970). As a matter of fact, it is emphasized that the system's thinking view is necessary to be able to understand the dynamic complexity of social systems (Senge, 2007). Systems thinking is a discipline for watching the structure that underlies complex situations, and for discerning high from low leverage change (Sterman, 2000). System thinking is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static "snapshots" (Senge, 1990).

Thus, from theoretical insights, it would rather be perceived and confirmed that system thinking is a crucial strategic problem of an organization. So, accordingly it can be helpful applying the system thinking approach and its implications towards our understanding of organization environment. It is moreover appointed system thinking a new way to create strategies, problem solving and find leverage points –always keeping the outcome/vision/goal in mind and a better approach for integrating new ideas within the system context (Warren, 2000). Empirically, CEOs must manage all the variables correspondent to environment of organization, especially the more often complicated changes which can be placed together and design the processes that tolerate all functions inside and outside the organization performance. Although, adopting to all these actions and reactions just made by CEOs are based on the CEO's belief dimensions which are prominently displayed in vision context of an organization and various way of thinking alongside the structural maturity of an organization. However, mathematical pervasive approach to complete understanding of human views and attitudes related to beliefs is so vague but there have been many recognizable models showing the constructing conceptual components of CEO's belief and system thinking arrangements affecting leadership performance. Palaima & Skarzauskiene (2010) according to the pertinent studies of such preceding dominant researchers, modeled the system thinking as a cognitive intelligence competence into six subsystems. Their work results is most effective, particularly for the section of manufacturing industry as well. Particularly, system thinking is one of the most important

components in Senge's original and formulation of the learning organization (Senge (2003)). He profoundly coordinated five disciplines for defining a learning organization. His proposed model consists of mental models, personal mastery, team learning, shared vision and systems thinking. Moreover, it should be paid attention that in Senge's work, system thinking is the cornerstone of the learning organization which must be further supported by shared vision to develop a common sense of top manager's beliefs and directions (Senge, 2003). Furthermore, Plattner et al., (2014); McGowan (2014); Viswanathan & Linsey (2014); Davidz & Nightingale (2008) highlighted the usefulness of system thinking frameworks for anticipating the emergent features of organizations. Zydziunaite (2018) gathered all the leadership values that have been discussed and researched by some authors. Respect, making difference, integrity, authenticity, courage and so on are the main dimensions which are addressed in this work. In another study, Daskal (2016) thought about the 21 core beliefs as the foundations of leadership that are in shared with all different societies or cultures. Leading by example, Balancing vision and execution, showing respect, accepting accountability, committing to courage and etc. are the certain beliefs which she believed on them for making greater leadership.

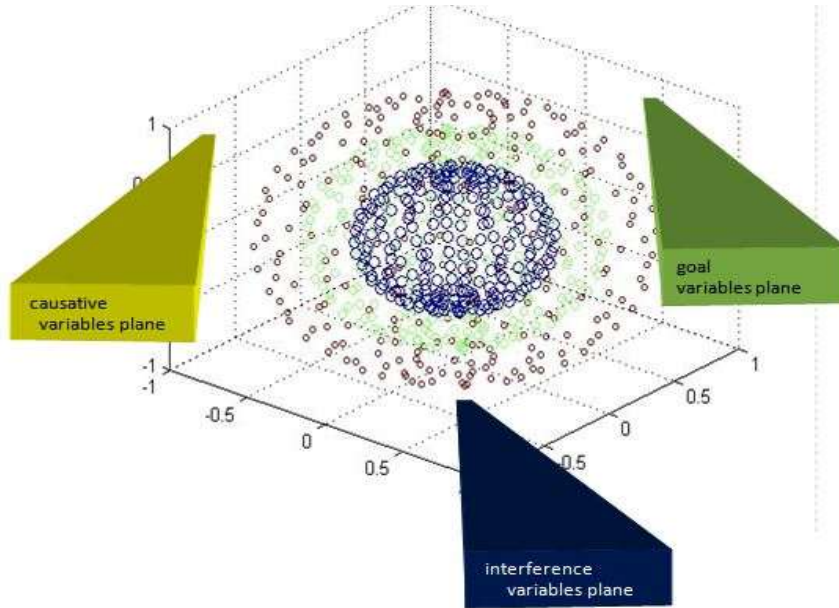
To be more exactly detailed in the various form of the previous models of leadership way of thinking, CEO's values, thinking dimensions affecting on organization's performance, business model, culture and also significance of system thinking, it could be resulted that practical usage of system thinking or the top leader's values actually depends on what space does it want to apply. More specifically, organizations are now continuously facing new regulations challenging their business model globally while the external changes are further exerting complexity due to their basic visions and also somewhere to some extent contradicting their business strategies. Thus, system thinking as a perspective application pursues us to modify and develop a better understanding of those complexities around any organization. Ascher (2001) defines complexity as the multiplicity of interconnected relationships and levels. He suggested that the two fundamental characteristics which so often attributed to complexity are emergence and nonlinearity. Generally, organizations as an interconnected sub-part, are functioning in the state of being situated in order and out of order conditions blended with complexity forced by internal and external powers. Of course, it is meant the complexity which is accompanied by organizations as the social complexity whereas ontologically system thinking is going to make set of orders in an ambiguity atmosphere. Organizational complexity drives system resilience, or the capacity to adjust to shifting external conditions or internal feedback (Holling & Gunderson, 2002). Concerning these definitions of complexity, it would be so useful to get the system thinking advantages to better manipulating and manifestation of organizational events. Besides, system thinking values and the beliefs and attitudes towards the organization's business model defined by CEO can provide a new face background of managing an organization as a module. In this useful state of the art, you can imagine everything for being tested or practically examined around the organization's context. For clarification of the matter being argued here, let's imagine a spherical space scheme (Figure 1) that stands for a typical organization bursting with too much interconnected linkages between internal and external variables.

Figure 1: Spherical Space Scheme for Organization's Linkages of Variables being Viewed by System Thinking Approach



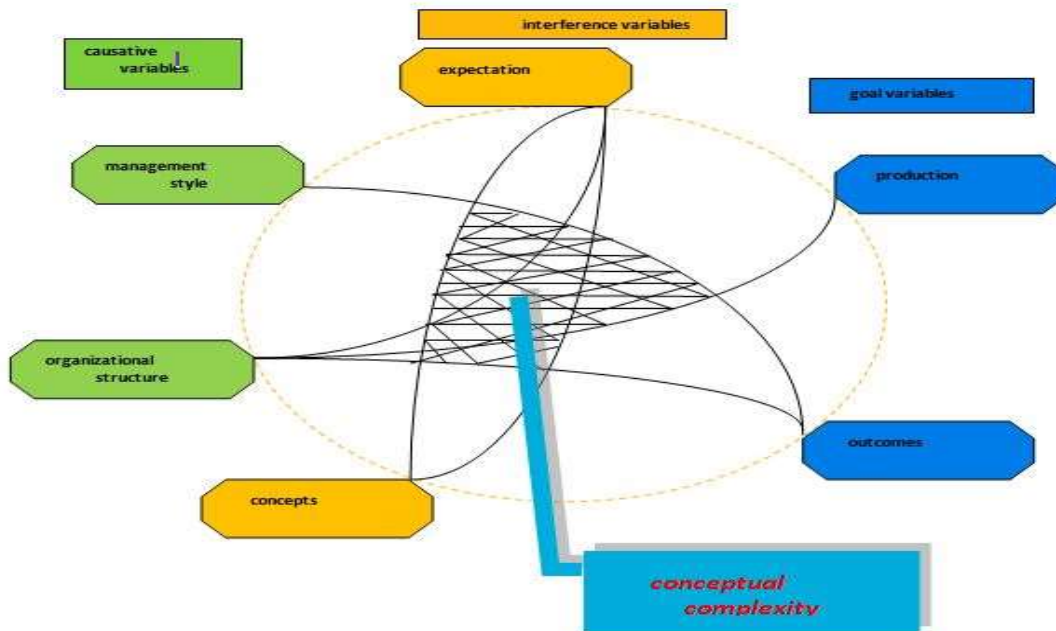
Experimentally while the various models erupted in different varying aspects of factors relevant to the organization's nature and its functions are being investigated, the more complicated situations that emerged. Indeed, as a common sense, most of those twisted factors are such a behavioral influential element. As an example, when the Likert's leading style model is considered to check the significance of three-dimensional factors and besides interpreting their correlations, it would be the proposed conditions being discussed. In this circumstance, there would be too many hypothetical routes that could be imagined reflecting the goal variables just being affected by casual variables. It is because, regarding the model there can be plenty of bands by those factors which are marked as points (Figure 2).

Figure 2: Likert's Three Variables Causation, Interference, and the Goal



On the other hand, on the other hand, in this space there are too many trajectories imagined fostering childish facts or thoughts towards the organization's interests. Making it more comprehensible, there has been a graphical diagram (Figure 3) plotted for showing the typical connecting paths among the Likert's model variables.

Figure 1: Shapeless Complexity Derived When Involving Systematic Approach to Organization.



As identified in Figure 3, the causative variables are likely to affect the goal variables, but these courses of actions are being distorted by interference variables which form the non-shaped intersections (meshed section in Figure 3). Inferring from what has been stated here and being linked to our proposal description of COE's beliefs and values, it is compromised that there are too many routes to use system thinking space, especially the one used here which will be discussed ahead. Consequently, there can be a shapeless paradigm, but undoubtedly its limitations and achievable boundary regarding organization environment is

certainly clear. And additionally, system thinking nowadays becomes an engineering approach emerging the interpreting of difficulties around the complexities adhered to such multiple interconnected parts just like an organization. System thinking engineering grew in response to the increased size, complexity of systems, environmental changing and making vital innovations for surviving any multipart creature. This would be the philosophy of what is considered the non-shape form of system thinking along side of complexity. Establishing a more practical and applicable connection between the CEO's values and beliefs and organization's prosperity is one of those challenging trajectories in our space of system thinking. Briefly, system thinking as scientific paradigm provides us to check the complexity which has no shape or formalized form. Although fundamentally, rush change and innovation are the two important features of the space of which is irregular just like a gum being chewed repeatedly. As a result, our non-impediment developing journey to definitely transect exactly the nature of CEO's belief to just like a dynamic process must be therefore progressed. Henceforth, in this paper, the CEO's belief would be known as a contraction form of CEOB. Finally, the following facts are logically extracted which is the foundation of the other part of this study:

"System thinking like the special doctoring and beliefs in general, is the manager who drives the social processes blended with shapeless complexity".

4. PROCESS OF CEOB AND SETTLING IT DOWN IN ORGANIZATION CONTEXT

One of the ways to improve the quality of results of an activity is to enhance the quality of thinking: how you think is how you act, is how you are (Haines, 1998). Consequently, bearing in mind the contextual considerations, it has been decided to use the system thinking framework as a comprehensive and an intelligible means for accomplishing our underlying study herein. More exactly, it is proposed to make a belief system as an ideological infrastructure to set some principles that helps CEO to interpret his/her everyday realities and behavioral attempts of the board of organization's directors.

4.1. Designing Multiplex Activities

4.1.1. Minded Bubble then First-the First (Basic Managerial Skill)

For the importance of managerial skills, it can be at first suggested to make a bilateral practical activity aiming to management skills by a predefined scenario. Actually, it isn't something overwhelmingly strange material. But first by providing a questioner, it would be asked by all board of directors what their reactions are if they are going to play the leadership role confronting to all circumstances associated with the organization management. It may be delivered to some extent as unexpected issue; however, it can be at least a challenge whatsoever that gives us a valuable chance to get their attitudes around the managing role. Second, the board of directors are ordered to freely outline the main projects of organization just declared by CEO. In this part, free handling of project manipulation has been considered. Finally, as a role play, they are asked to turn as a CEO in real conditions in an office to handle all processes associated with organization's affairs, controlling tasks and making decisions. In this activity as a work-test, the two basic management theories are hidden as the foundations of the proposed function. According to Robert Katz's theory (Katz (1955)) the three basic types of management skills are implicitly being tested in this part of action. Knowledge of using a variety of plausible techniques to achieve the organization's objectives, the knowledge and ability of how to formulate some ideas, presenting creative solutions and the skill of humanitarian interpersonal management are some fields of interests that can be derived exactly. The other fundamentally important theory, which is being examined here latently, is the famous theory of Parkinson. A rule of thumb which states that "work expands so as to fill the time available for its completion" (Parkinson (1955)). Proactively, if each one of the board of directors is picked up to manage the organization, then her/his desire to plan and outline all the projects on their own authority would be grasped. Consequently, task timing, daily schedule, being agile in real conditions, self-efficiency and creativity engaging to break down his/her tasks, job assignments to employees are now being challenged particularly when they are overlapping to some extent for some functions which are being run.

4.1.2. Minded Bubble then First-the Second (Agility)

In another one adventurous contemplated try, there is a practicable and feasible test which is designed to examine closely the agility of reactions of board of directors. Specially, in accordant to CEO's predefined programs there have been periodically planned the routine major activities to be announced in public meetings. Usually, these public meetings are held predictably due to a time known algorithm. This phase of the test is so clear for all the staff of organization. It is an aforethought and intentional command that shows the authority aspect of CEOs. At the same time, it may be supposed to hold some meetings as immediate summons and masse. Here, chaos theory would be the core rule which this test is based on. Chaos theory, which is the study of nonlinear dynamic systems, promises to be a useful conceptual framework that reconciles the essential unpredictability of industries with the emergence of distinctive patterns (Cartwright (1991)). Basically, it is meant by chaos that CEOs should hold some organization's official meetings without them calling attention. Thus, the unpredictable behaviors of all board of directors and particularly the effect of random changes on their decision making would be monitored.

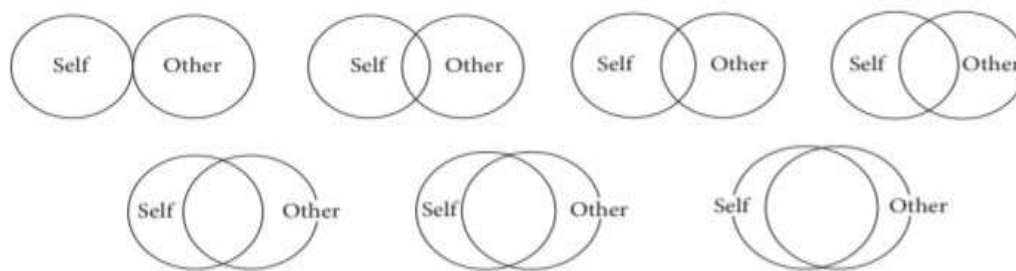
4.1.3. Minded Bubble then First-the Third (Collaboration Skill)

Furthermore, having perception of fact that a well-run communications digital system keeps the workplace more efficient by providing fast correspondence and aiding in the decision-making process by offering easy access to relevant information. In the other part of our work test, it must be agreed for a while to disconnect all the instance digital messaging inside the organization only for the board of all directors. Meanwhile, it would be the time during which all actions and necessary related functions shall be done just by face-to-face meetings between the board of internal directors. Ensuring that all parts of the organization are functioning cohesively, determining how well information is linguistically shared throughout the board of directors, communication and interpersonal skills of how well outlined procedures determined by CEO are the proposed issues related to this point of view. Additionally, according to Tuckman's teamwork theory, the interpersonal or group structure, and the task activity would be the commonly known features which can be assessed during the period of digital system disconnection (Tuckman & Jensen (1977)). Team development, and the alignment of decisions made by all board of directors on the same problem, help the CEOs to understand how teams evolve in the organization.

4.1.4. Minded Bubble then First-the Forth (Homomorphism of Actions)

As for the other work test, it can be decided to persuade CEO to suddenly attend the internal sub-department daily, weekly or monthly meetings on purpose. Board of directors of a company or an organization have their own meetings with the staff of their sub-controlled department. They have been usually planning the activities, projects, allocating jobs to the right personnel and getting the daily or weekly reports. Moreover, they are always monitoring the performance of employees who are doing their duties. Besides, they can get feedback data of which needed to complete the designated jobs on time. Sometimes at these meetings, they give important advice on how to achieve work on time. Although, having determined all the material, monetary, informational resources, it may be required to use the legal authority of board of directors to make some adequate preparation or arrangement for jobs to be sooner done. CEOs, of course, have a great deal of help and resources at their disposal (Porter & Nohria, 2018). The board of directors of a company has three main functions: monitoring, advising and contracting. It has legal authority to ratify and monitor managerial initiatives, evaluate the performance of top managers, and reward or penalize that performance (Fama & Jensen (1983a), (1983b)). Empirically, every director has his/her own way of dealing with the problems, managerial method, strategic way of manipulating works, interpersonal behavior, work commitment level and indispensably significant values. All these vital features can be inspected overall while CEO attends simultaneously at meetings held by every director. A straightforward way to partially identify director behavior and work effort is to investigate their board meeting attendance (Chou, Li & Yin (2010)). Hence, to our knowledge, CEO's decision to attend unexpectedly at those meetings just held by each director is proposed to increase his/her understanding of each director's functional performance one by one. As a matter of fact, the main principle governing this work test is the theoretical approach of the inclusion of others in the self-expansion model (IOS scale) that suggested by Aron et al., (1992). About the Aron's model, it is fundamentally conceptualized on the cognition process. There are two distinguishing aspects of psychological subjective experiences in IOS scale. They are as the closeness and experiencing other's outcomes and responses as one's own. Moreover, the basic fact in the IOS scale is the notion that in a close relationship the other becomes "included in the self" (Aron et al., (2013)). When we include another person in the self, our cognitive construction of the other overlaps with (or shares activation potential with) our cognitive construction of the self (Aron et al., (1991)). Thus, to the extent we include another in the self, we take on the resources, perspectives, and identities of that person, and we share that person's outcomes. The other person then informs who we are, enhances the tools we feel we have at our disposal, shapes how we see the world, and affects the costs and benefits we perceive ourselves to incur (Aron et al. (2013)). An inspired contribution to this model, it would be imagined that CEO (as self-circle) attending at director's meeting (as other circle) with his/her employee gradually improve the overlapping point of views discussed about the organization's goals. Aron et al. (2013) proposed that these metaphors of circles as a cultural community or as social environment overlaps slightly more than the preceding pair (figure 4). Typically, these metaphoric circles could be addressed as some important features regarded by top leaders (like a CEO) and some features showing the employee's goals. Consequently, CEO's attending those meetings mentioned and summons would cause better understanding of what is happening at the lower level of organization structure.

Figure 2: The Inclusion of Other in the Self Scale

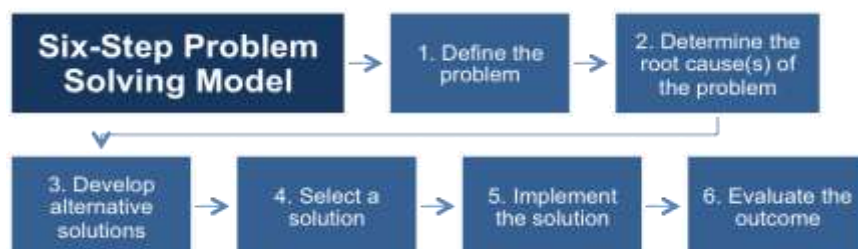


Source: Aron, A., Aron, E. N., & Smollan, D. (1992).

4.1.5. Minded Bubble then First-the Fifth (Problem Solving Skill)

The other way to make rich our program of work-test would be to get comprehension understanding of each director's problem-solving methods and presenting some alternative scenarios for those situations which happened before. It is meant the previous events which were critical or even catastrophic for the organization's performance and its resource management as well. Particularly, the problem-solving skill as a crucial role for leaders to take on would be our interest in offering this work-test. Every director, as a leader, needs to approach problem solving as an opportunity in a non-active situation to challenge himself/herself. The hidden idea about this approach is about director's striving to practice eliminating the barriers that can delay his/her managerial progress throughout a career. Additionally, the background philosophy of problem solving here is based on Karl Popper's approach (Popper, 1999) of problem solving. He eloquently stated, "All life is problem solving". Leaders along with all staff are living in organizations. Thus, problems exist everywhere and every time. So, problems occur in every organization. Furthermore, as a best practice, Liker suggested 4P model of Toyota corporation way which is depicted on (Liker, 2003). In his suggested model, Liker says "employees always look for ways to solve various problems of the company, which implies constant self-improvement and learning". Therefore, according to the six-step problem solving model (figure 5), problem solving practices can improve the director's ability to analyze, making some solutions, root cause analysis, diagnose and deal with problems effectively. More briefly, Learning, brainstorming, time management and creativity are the major results of this work-test.

Figure 3: The Six-Step Problem Solving



Source: www.free-management-ebooks.com/six-step-problem-solving-model

4.1.6. Minded Bubble then First-the Sixth (Holographic Approach)

In another distinct way, a work-test is purposed in order to check the holographic leadership's skill of each director and the holographic paradigm of the whole organization. So, it may be allowed to abandon some directors attending on their offices. Then, the excluding director's functions and assigned activities which outlined by CEO are designated to one of directors left in organization. As a matter of fact, in this plan, it is deliberately intended to examine whether it is possible to see and find the holographic characteristics of our organization. Being more precise, it would be accurately expected to seek the organization as a whole into such smaller parts which can regenerate the entire image of the same organization. On the other hand, as can be perceived, integrity will be the most significant factor that holography is trying to implement in such a complicated organization. Practically, when a nominated director is to be appointed to get the position of another director, then he/she presumably will share his/her assumptions, values, beliefs, and attitudes to the new situation. Therefore, the staff who are pushed into a specified position should cope with new official values, beliefs and probably new expectations. Having got feedback from those foregoing mentioned staff, will apparently appear the contradictions of the attitudes, visions and beliefs of the two directors who are playing in this scenario. Fundamentally, holographic structure has originated from the capability of human brain to fully function

even if some parts of it have been removed. This great idea was first described and developed by neuroscientist Pribram (1977). He has argued that in a hologram paradigm like the human brain, any part of the hologram with sufficient size contains the whole of the stored information. Correspondingly, in a typical organization, while picking up a sub-department as a minor part, it must stand for the whole organization. In summary, it substantially means that every part and even every individual regardless of his/her position must reflect the same beliefs, visions and values of the whole organization in their behavior and work responsibilities. This work test can be justified in another form of approach and that is to be applied to shape up holographic leadership. Byars (2008) by just reviewing all related ideas about holographic leadership suggested a new heart-mind model which is founded of physiological coherence and psychological balance. She was really making efforts to propose a coherent group dynamic towards holographic leadership. She also concluded that holographic leadership is part of evolutionary learning for leaders for holding the environment of an organization through a coherent physiological state, with integrity of action. Eventually, gradually practicing of this work-test would proclaim making an organization a coherent environment with uniformly dispersed values and beliefs.

4.1.7. Minded Bubble then First-the Seventh (Teamwork Ability)

It is going to moreover suggest having set some hours of a week to devote themselves to practical games like a workshop for organization leaders or all directors. Indeed, there is considered to arrange and coordinate teamwork plays to develop the team working skills at an unofficial space of the organization. Vividly speaking, here it is going to offer team building exercises for improving communication, morale, motivation, settling common goals, self-confidence and productivity of directors. Basically, it is purposefully intended to better enhance the team cohesiveness of organization's main directors. Usually, CEO rely upon on his/her board of directors who have been teamed up and committed to move simultaneously in a direction which guarantees the organization's mission effectively. Thus, teamwork would be signified as work must be done through a whole kind of employee. Kirkman (2000) defines a work team as a group of individuals working interdependently toward common goals and whose members are mutually accountable for task accomplishment. A work group is made up of individuals who see themselves, and who are seen by others, as a social entity, who are interdependent because of the tasks they perform as members of a group, who are embedded in one or more larger social systems and who perform tasks that affect others (Guzzo, & Dickson(1996)). Robbins (2000) describes a work team as a group whose individual efforts result in a performance that is greater than the sum of the individual inputs. So, higher performance of teamwork, the better the organization's goals are. In this sense, teamwork games could be inevitably beneficial to strengthening the capabilities of collaboration. Generally, there are many games that can be found at <https://blog.cake.hr/top-50-team-building-games-employees-love-play>.

4.1.8. Minded Bubble then First-the Eight (Momentum Exciter)

Additionally, it can be decided challengingly to speak up an appealing call attention to a big and inspiring decision all over the organization context. It would be just about the notified issue of it. " It is resolved that you may be nominated as a leader/CEO and play his/her role of actions and duties tomorrow ". It is really by the first notion targeted to evoke an enormous attention paid to the CEO's distinguished and unique work. If it is believed that people working at all levels of organizational structure are most valuable assets, then it will be desirable and very attractive to have each employee acting and thinking like a leader. Logically, higher sensing of each employee's understanding of the mission, vision and values of company and firm and acting more likely to CEO's managing behaviors than higher synergy is attainable. Of course, the term "act and think like a leader" is borrowed from the grand Ibarra's work (2015) who wrote the book "Act Like a Leader, Think Like a Leader". Her main research focuses on how people come to see and define themselves as leaders. "When we act like a leader by proposing new ideas, making contributions outside our area of expertise, or connecting people and resources to a worthwhile goal (to cite just a few examples), people see us behaving as leaders and confirm as much. The social recognition and the reputation that develop over time with repeated demonstrations of leadership create conditions for what psychologists' call internalizing a leadership identity—coming to see oneself as a leader and seizing more opportunities to behave accordingly" (Ibarra (2015), Act Like a Leader, Think Like a Leader, p.4). Applying this cyclic approach named as "outsight principle" (Ibarra(2015), Act Like a Leader, Think Like a Leader, p.4) especially towards the board of directors will bring them an opportunity to see themselves into a challenging environment while experiencing new ways of thinking about the values or strategies and reshaping what each director can do. "The principle holds that the only way to think like a leader is to first act: to plunge yourself into new projects and activities, interact with very different kinds of people, and experiment with unfamiliar ways of getting things done. Moreover, it does help directors as the internal leader to learn about themselves and broaden their knowledge of potentiality to play as a CEO. This knowledge can only come about when you do new things and work with new and different people. You don't unearth your true self; it emerges from what you do" (Drucker (1994)). So, implementing this overwhelming procedure will result in finding some vital propositions and evidence which reflect the gap between the CEO's values and visions and his/her board of directors practically. Besides, making use of this notion according to Drucker's theory of the business (Drucker (1994)), a CEO can investigate about the synchronization of what he/she believes about and what are the other people's realistic behavior regarding to move at a strategic course to reach the same destination of organization's mission, values and beliefs.

Obviously speaking, CEO could have an alongside opportunity to get closer look into people's beliefs and their individual definitions of organization's mission and values. However, it is here purposefully meant to have a macroscopic view of the feedback which obtained applying Drucker's five leadership questions (figure 6). Since strategy perception by employees and focusing on programs to cover the organization's strategy, are nowadays essential factors to succeed in the volatile environment capturing an organization, then it has just been intended to develop Drucker's questions list by adding one another different question of "what are our core strategies?". Additionally, this survey would probably cause the momentum of organization wiggling. At least it can to some extent help CEOs vibrating the organization's static inertia. Historically, inertia has been always against momentum. As a matter of fact, these two physical terminologies are always in opposition inherently. Organizational inertia is usually accompanied by uniformity in actions, lack of energy and resistance to change. Amburgey & Miner (1992) defined it as staying in uniform motion. Organizational inertia is the tendency of a mature organization to continue its current trajectory (Gilbert (2005)) and vice versa momentum is the dynamic force (Jansen (2004)). For an organization the [momentum P] formula $[P = MV]$ factors can be described as the mass [M], being the number of people who are clear on the strategy, contributing, understanding the direction, and what the strategy means to these individuals. Velocity [V] is the rate in achieving the described output daily (Baird (2014)). Finally, this work test can assist CEOs to expand the organization's goals, vision, values and strategies.

Figure 4: The Five Most Important Questions



Source: Drucker, P. et al. (2008)

4.1.9. Minded Bubble then First-the Ninth (Job Rotation Method)

In the other part of our work tests, the job rotation scheme has been deployed to get better understanding of the conflicts which exist between the state of each director's decision making while he/she is in another position of sub-management conditions. Apparently, it is meant to replace director A position with director B position and vice versa at certain time intervals then eventually returning to the original positions for each director. At this new figure of different positions, they are wanted to role play each other managerial actions. Reasonably, there would be at least one important profit associated with job rotation process for each director, and it is to be exposed to new set of knowledge that can be learned and a wide range of work experience. Job rotation also results in firm learning (Ortega (2001)). Generally, it may say that job rotation is a way of developing director's behavioral skills to vast and improve their style of interacting with other employees and taking on new responsibilities. Campionet al., (1994) believed in the two main beneficial influences of an employee who rotates. First, accumulate more quickly and second, accumulating experience in more areas than an employee who does not rotate. More importantly, there has been a precious result related to job rotation technique applying in an organization. The people and particularly the top directors/ leaders who rotate in different positions would become the generalized personnel equipped with new dimensions of abilities. Ouchi (1981) reported that the extensive use of rotation by Japanese companies would explain why Japanese employees are more often generalists than specialists, in particular when compared to U.S. employees. Moreover, the employee motivation argument is the most interesting contribution of job rotation plan especially for the plateaued employees. Consequently, having all the pleasant qualities of job rotation, it will be very useful for CEOs to get reach of directors who are competent and skilled in a wide range of experience of organization versatile work.

4.1.10. Minded Bubble then First-the Tenth (Process Revision)

And the final work test is to request from all board of directors to write down all modifications about the total current state of the running processes in organization which are thought to be inserted to complete or cut from them. The first approach deployed for this work-test will preliminarily get insight view on the core process by directors who are themselves engaged in driving some processes. Specifically, this part of action is essential for understanding how the core process works totally and what important

interlocks the core process has with other components. Once they know how the core process works and operates, then they can analyze it to get certain improvements. These improvements can be separated in two sections: first, adding some linked procedures in core process that brings much more value for its output, second eliminating some procedures from core process that are now thought to make the core process run slowly or inefficiently (As-is process). Furthermore, the work-test here is to be continued in the second part by making a requisition from all directors to inspect the integrity of reviewed process with their strategic indicators. The auditing phase of this work-test is based on the Hammer and Champy BPR theory to revamp the process for yielding superefficient goals (To-be process). Hammer & Champy (1993) defined Business Process Reengineering (BPR) as a fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service, and speed. Business process reengineering (BPR) is a technique that can be used for analyzing an organization's business processes and suggesting required alterations to attain strategic goals (Aikins J., 1993). Sikdar, & Payyazhi (2014) have determined BPR implementation as a consecutive process encompassing key activities that are needed to redesign the business processes. However, reaching a higher version of the process depends on the organization's cultural and structural maturity, but this work-test has at least an important delivery and that is to be concentrated to the whole process by the directors. Generally speaking, deeper analysis of the process by the directors can help them to enhance the process integrity all over the organization. Summary speaking, these are the ten suggested bubbles that CEOs can experimentally select from. It is worthwhile to notice that curation of each one of the proposed bubbles, then starting to ignition and propelling them to situation, really depends on the accurate CEO's observations all over the organization. Fundamentally, as the first step, those perfect observations are the main input arguments of the under studied process which is called hereafter "CEOB" process in this research. The next step forward would be the prioritization of each bubble to be picked up for operating. Basically, this point of reactions made by CEO rely on the way of his/her belief for upcoming future of organization. So, letter B in CEO stands for this belief. To make rich the CEOB process, it is needed to explain much more about it. As mentioned earlier, the observations known as the input of CEOB process would be available from such numerous sensors that softly embedded at organization context. Some of these sensors are the organization's key performance indicators exactly related to organization's Growth in Revenue, Operational Cash Flow, Average Time to respond, Percentage of Market Share, Employee Satisfaction Rating, Employee Churn Rate, Planned hours of work vs. actual situation, Percentage of projects completed on time, Return on investment (ROI), Budget variance, Workload efficiency and so on. Practical management of CEOB process will be discussed in detail and more accurately in the following part of underlying study. Ultimately, it is time due to select a name for our model. It would be named as "chewing gum model". However, the reason for which the name dedicated is also to be argued in the following part.

4.2. Management of CEAB (How to Chew the Gum)

As has been repeatedly clarified in the last decades up to now, organizations are being gradually characterized with the two most important extensions. Globally extended organizations and strongly affected by multi-dimensional nonlinear data are the two distinctive aspects that cause the complexity phenomena has been arisen in organizational management and furthermore make the organizations distance from simplicity paradigm. So, the two concepts of simplification paradigm versus complexity paradigm have been risen. Olmedo (2010) gathered different aspects associated with these various paradigms. In addition, Simon (1995) highlighted the limitations in informational and cognitive scope and capacity of managers to make optimal decisions in complex situations, due to bounded rationality: "bounded rational agents experience limits in formulating and solving complex problems and in processing (receiving, storing, retrieving, transmitting) information". Thus, the organizations being mixed with complexity and far from the state of equilibrium must be managed by leaders who have always been engaging with "the impossibility of perfect knowledge, and the oscillation between order and disorder"(Edmonds (1995)). Consequently, leaders are engaged with a material of managing a complex system whose identity is obscure due to such a profound informational change. Moderately, the vague and murky space of managing a complex system and reasonably according to the shapeless paradigm of complexity may lead us to perform a procedural program to have continuous improvement. Hence, to start programming for each of the bubbles being active, it is offered to begin with the organization's dashboard application where there are some important indexes showing the yearly, monthly, weekly or even the daily key critical success factors. Indeed, traceability of these mentioned factors is either very common or too vital for CEOs. Actually, it would be extremely outstanding for CEOs to commence an improvement project which resulted from such monitoring on an index. So, it is inspired to depict a model founded on the three known frameworks and the one analyzing detector as follows: The PDCA cycle framework (Deming cycle)→ The Kaizen philosophy (Kaizen is endless, a philosophy of never being satisfied)→ Quality triangle (cost, time, quality)→ Analyzing detector (V/P-& TFP) Being more detailed, the PDCA model is the basic structure for our proposal. It would be really a step model for carrying out and implementing a systematic change and beneficially equipped us with a flexible tool to work toward the continuous improvement all over the organization. Additionally, the kaizen philosophy has been applied to make rich the proposed model. It may be necessary to definitely state that the kaizen philosophy is here intentionally exploited even for those organizational conditions derived from critical success factors or other indexes which are rather at good or the best level and this is what will be our aimed core direction of this study which called CEOB conceptual philosophy. There is always by kaizen a path for getting better in actions and also in decisions which made due to some unsatisfying indexes to survive in competitive world of business and management.

Thus, according to this point of view, a CEO will be busy chewing gum for producing some minded bubbles and bursting them suddenly into reactions or actions forever. Structurally, CEOB model has no previously timed pattern to get involved into making minded bubbles. So, CEOs are always absorbing signals and involving them in appropriate actions or reactions.

Obviously speaking, CEOB framework indicates that CEO's beliefs must be always sensed and fully understood like a shadow everywhere and every time and moreover be gone into all passages of the organization context. On the other hand, CEOB paradigm is producing the minded bubbles floating everywhere and every time in an organization. Thus, CEOB loop can flexibly produce minded bubbles for further actions to be applied across the organization. Some of them are targeted-minded ones that are going to modify some indexes partially or to enhance organizational behavior and some of them are those arbitrary ones to design several plans for proactive actions relevant to different issues of organizational materials. It would be a non-stop progressive process for CEOs to monitor all the organization's behavior, particularly the board of all directors' outputs. Moreover, CEOB model gets its input vectors from some main indicators. The quality triangle paradigm including the financial, time and quality measurements and two process signals are the input sensors for the systematic exploration motor phase. In this study, it is suggested to use the OHI financial indexes (figure 7) for its vast and diverse insights by the nine major diagnostic tools to view the organizational health as a whole body. Besides, it has been decided to add two signal indicators focusing on the director's performance. They are as follows:

1. V/ P (Response velocity per all process done) 2.TFP (Total factor productivity scale) The first signaler indeed shows what the response velocity of each director per all designated tasks or his/her under controlled activities is. Monitoring V/P factors of all board of directors can produce a chain of data correspondent to the overall response velocity of an organization. Furthermore, it can help CEOs to reach a norm of velocity due to existing processes while it will analytically highlight the functions or tasks that cause low speed procedures in the value chain of core process. The other signaler is the TFP measure. Specially it is meant the productivity of manpower of an organization. TFP can totally exhibit the productivity of any sub-department of an organization which is managed by each director. Like the first signaler, it can also create a chain of data realizing the minimum and maximum TFP between each of the sub-departments of an organization. It would say that TFP monitoring correspondents to the internal departments of an organization can lead CEOs for better understanding of employee productivity. Using the upper 4 bullet points, our proposed system management, CEOB model is built and diagrammed as the following flowchart (figure 8). Building a management system helps highlight the need to have better understanding on how to measure and analyze performance, what to measure, and where to improve (Phusavat (2007)). Thereby, a non-interruptive and open approach of management system application, which is continuously receiving data, processing them and finally generating the practical improvement activities is made.

Lastly, CEOB model is chewing the input signals and indexes first, making the minded/arbitrary bubbles and fisting the picked-up ones to take operational functions towards the betterment. Consequently, it may lead us to more complexity using CEOB, but this complexity is to be inevitably managed by CEO.

Figure 5: A Diagnosis Tool for Organization’s Health Developed by McKinsey & Company, 2012.

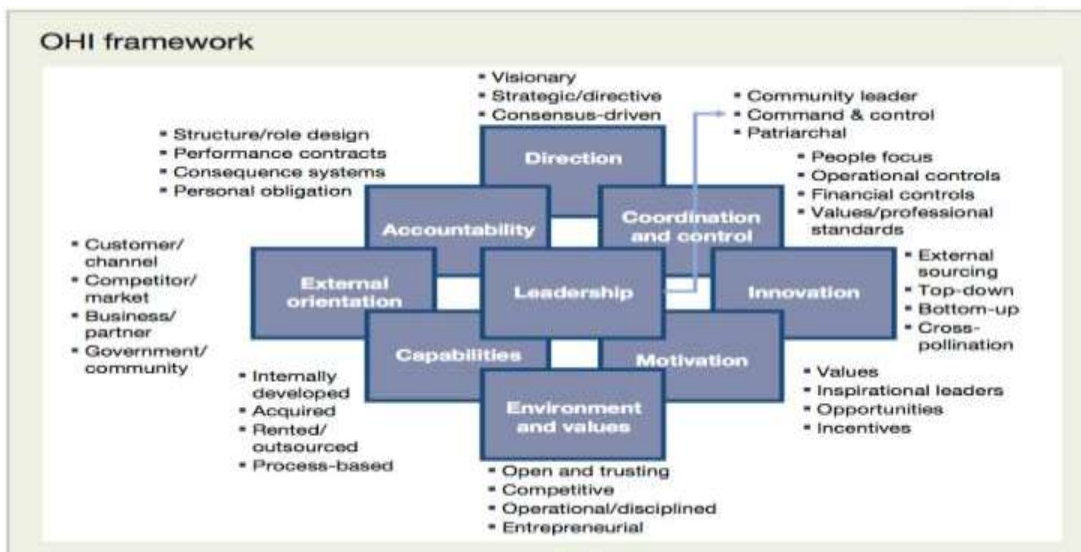
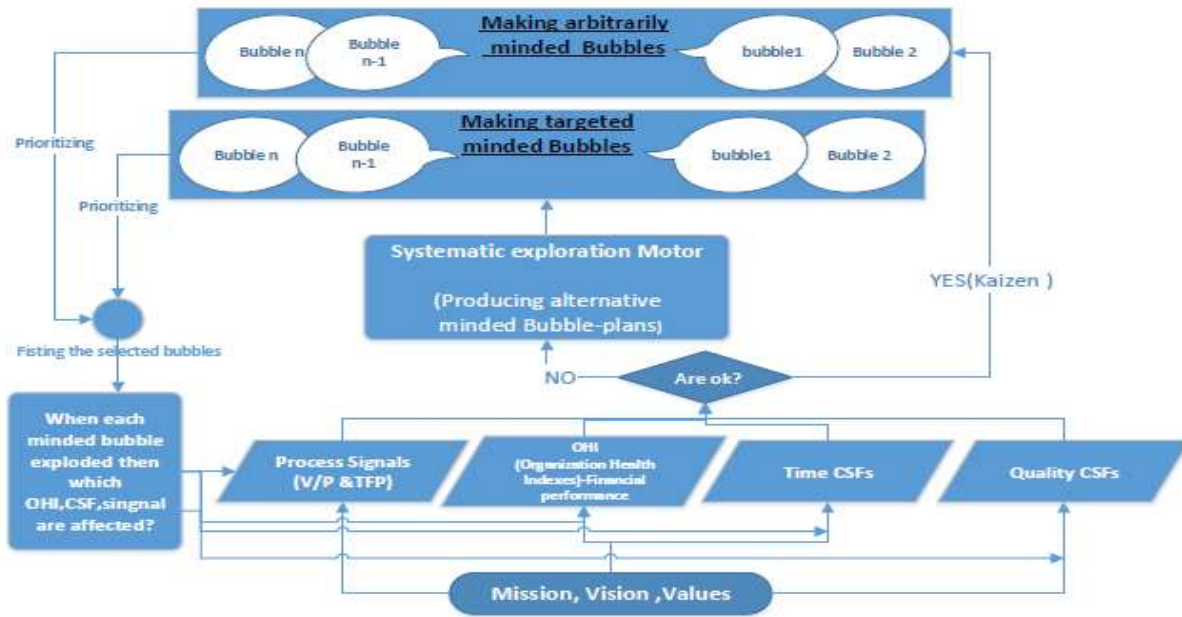


Figure 6: CEOB Model



4.3. CEOB And Organization Thrive

“Awareness alone is not sufficient for change. One must be mindful of the necessity to practice, practice, practice in order for the new perspectives and behaviors to become enduring personal qualities” (Hanson, 2000)). More likely, CEOB GUM conceptual paradigm (figure 9) has been constructed to really run some practical and operational projects for improving the ultimate performance of an organization. These projects attacks to shooting to some indexes toward the better level of performance. Hence, it should be taken into account that CEOB is looking for higher prosperity and when it begins to operate, the change of organizational behavior among the staff all will birth along with closer look at how the organization can effectively evolve and thrive over time. To be more emphatic on this important aspect of CEOB paradigm, it should be noticed that its input vector comes from the mission, values and vision of an organization. Additionally, running the arbitrarily minded bubbles may affect several indexes or behavioral factors of organization. And more, CEOs as the principal supervisor of the "minded bubbles then first program" must be afforded by him/herself to learn more about the managerial skills to guide the exploded projects. Therefore, they need to develop their knowledge to automatically play an active role in their scope of management. They are the main planners of the CEOB model. They would be the parents who have been scanning their children to establish strong involvement efforts to grow. However, a successful program produced by CEOB dependently requires all and sundry effectively engaging in each defined "minded bubbles then fist program". It is very important for CEOs to always remind the board of directors to assess the conducting power they have in each plan of CEOB. Most significantly, utmost care shall be done about the fact that personnel are all now in a liquefied environment made by minded bubbles who want to implement systematic approach into an organization for achieving magnificent goals that are sensed everywhere and every time in the organization's context.

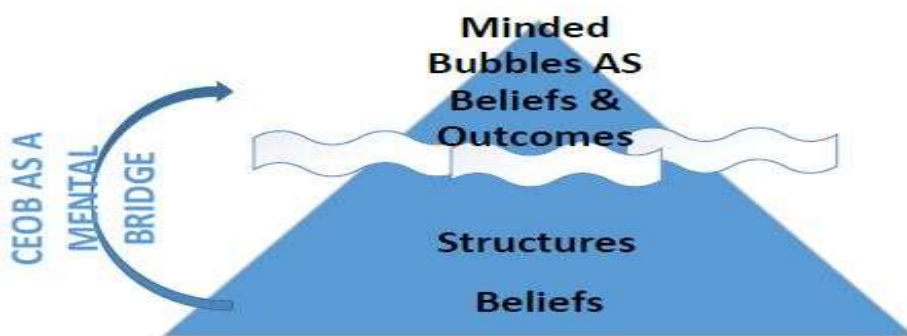
Figure 7: CEOB GUM Conceptual Paradigm



4.4. Revealed Beliefs Like Background Shadow Supplement

CEOB model is fundamentally alluded to CEO's direct actions and reactions to all organizational outcomes conformed to his/her beliefs. Roughly speaking, CEOB will be categorized in mental models because of its emphasis on beliefs who drive the core configuration of the model. From the iceberg model, it is promptly derived that beliefs would be intrinsically an unseen part of a behavior or an event done by people. Actually, iceberg model certainly shows that individual's values and beliefs are as their strong guiding force in how they plan programs, determine priorities, make decisions and explanation of any social behavior of human beings. But on the contrary, if a tremendous insight into the CEOB philosophy is taken, it would be extracted that there are some nonstop incentive programs of minded bubbles going through the organization's context. As has been already mentioned, CEOB paradigm as an organizational mental bridge is going to cause the CEO's beliefs to be visible and sensed every time and everywhere. CEOB can make a liquefied shadow of CEO presenting forever in the background of any improvement program. Purposefully, this essence part of CEOB paradigm tries to revise the iceberg model at least for all CEO's beliefs which are now assumed to be latent. So, CEOB will reconfigure the iceberg model as shown in Figure 10.

Figure 8: Reconfiguration of Iceberg Model based on CEOB



5. CONCLUSION

This study has been generally focused on the chief executive officer's role of actions and his/her systematic beliefs in an organization. First, the importance of CEO's role, his/her values and beliefs, has been reviewed. At this step, there has been also concluded that CEOs are the leaders who shall act or react in an organization environment that would be under internal and external forces. Furthermore, these heterogeneous forces apply a space of complexity in which its identity isn't too clear to check all factors together. System thinking approach as a multifaceted tool was deployed to propose a new concept of shapeless complexity that is blended with any organization today. System thinking is inherently so complicated to model uniformly.

Shapeless complexity and system thinking are the two main combined aspects that let us manipulate CEO's beliefs toward the directed goals by an endless improvement paradigm. Besides, the kaizen approach is also deployed for making an endless loop algorithm. This algorithmic paradigm is based on CEO's values and beliefs which are named CEOB. CEOB systematic motor and kaizen are always active with an endless loop to produce some targeted or arbitrary minded bubbles for further actions. As a matter of fact, CEOB is always chewing preliminary beliefs and results gained from some indexes then making, prioritizing and fisting the minded bubbles. The most important outcome of CEOB paradigm would be the fact that CEO's beliefs are being sensed everywhere and every time in an organization. Indeed, CEOB paradigms by running several planned programs, cause a new feature of CEO's attendance into the organizational context like a liquefied shadow forever. Contrary to iceberg model CEOB paradigm attempts to make a mental bridge to show CEO's beliefs which can be seen anytime and anywhere. Additionally, the core contribution of CEOB is to gradually engage all people, especially the board of directors, for acting like a chief executive officer. Finally, these are all derived from the system's thinking approach along with the complexity blended in organizational managerial issues. Systematic thinking for such complicated materials of complex systems as an organization will birth a space with which no shape can be mathematically imagined. Accordingly, when you are involved in handling and controlling a complex system, there will be inevitably other layers of complexity born due to shapeless characteristics of complexity.

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FROM TECHNOLOGY ACCEPTANCE TO ARTIFICIAL INTELLIGENCE ADOPTION: COMPARATIVE INSIGHTS FROM THE UNITED STATES, SOUTH KOREA AND TURKIYE

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ABSTRACT

Purpose- This study explores the conceptual transition from the Technology Acceptance Model (TAM) toward emerging Artificial Intelligence acceptance perspectives while comparatively examining technological development and its associations with sustainability indicators in the United States, South Korea and Turkiye. Despite growing literature on AI adoption, cross-country assessments linking AI capacity with environmental performance remain limited. This study addresses this gap by evaluating the alignment between national AI development trajectories and sustainability outcomes.

Methodology- The research adopts a comparative descriptive design based on secondary data from internationally recognized reports and statistical databases. Country-level indicators related to AI investment, innovation capacity, carbon intensity, renewable energy use and environmental performance are systematically compared. The study does not aim to establish causal relationships but rather to identify associative patterns across countries at different stages of technological development.

Findings- Results suggest that higher levels of AI investment and technological capacity are descriptively associated with improvements in energy efficiency, reductions in carbon emissions and enhanced environmental performance. However, the strength of this relationship varies according to national technological readiness and institutional capacity. The United States shows the strongest alignment between AI development and sustainability improvement, South Korea demonstrates moderate progress, and Turkiye shows ongoing technological development, although sustainability gains remain comparatively limited due to structural and implementation challenges.

Conclusion- The study extends technology acceptance discussions beyond the individual level by presenting a comparative national framework linking AI adoption with sustainable development outcomes. Findings indicate that technological investment alone is insufficient; effective sustainability performance requires institutional capacity and coordinated policy implementation. The results offer practical insights for policymakers seeking to align digital transformation strategies with long-term sustainability goals, while future research should broaden comparative scope and examine sectoral and long-term impacts of AI adoption on sustainability performance.

Keywords: Artificial intelligence, artificial intelligence acceptance, sustainability, technology acceptance model, cross-country comparison.

JEL Codes: C33, O33, Q56

1. INTRODUCTION

Artificial intelligence (AI) technologies have become increasingly influential in shaping productivity, innovation capacity and sustainable development strategies worldwide. Recent global assessments suggest that AI-driven applications have the potential to generate significant economic and environmental benefits, reinforcing their strategic importance in long-term development planning (McKinsey Global Institute, 2023; World Economic Forum, 2023). However, the pace and scope of AI development vary considerably across countries with different technological infrastructures and institutional capacities, including the United States, South Korea and Turkiye (OECD, 2024). The Technology Acceptance Model (TAM) has long served as a foundational framework for explaining individual technology adoption behavior (Davis, 1989). While TAM provides strong explanatory power at the individual level, it has been criticized for its limited capacity to account for institutional, structural and policy-driven determinants influencing technology diffusion at broader organizational and national levels (Venkatesh et al., 2016). As AI systems increasingly operate within complex socio-technical environments, understanding technology adoption requires moving beyond individual behavioral intentions toward macro-level perspectives that incorporate governance capacity, digital infrastructure and innovation ecosystems. In response to these limitations, emerging artificial intelligence acceptance perspectives seek to extend traditional acceptance models by integrating dimensions such as institutional readiness, national technological capacity, digital infrastructure and regulatory frameworks (Shankar & Datta, 2022). Macro-level technology diffusion, particularly in the case of AI, is shaped not only by user perceptions but also by structural and institutional determinants that influence how technological capabilities translate into broader developmental outcomes.

Recent international statistics illustrate significant differences in AI investment and innovation capacity across countries. The United States leads global AI research investment, reaching approximately USD 330 billion in 2023 (Stanford AI Index, 2024). South Korea allocates nearly 4.9% of its GDP to research and development, positioning itself among the most research-intensive economies globally (OECD, 2024). Türkiye has also strengthened its institutional and strategic framework through the implementation of its National Artificial Intelligence Strategy (TÜBİTAK, 2023). These differences in technological capacity are reflected in environmental indicators: over the past decade, carbon intensity has declined at varying rates across the three countries, while renewable energy consumption has shown differentiated growth patterns (World Bank, 2024; IEA, 2024). Despite the expanding literature on AI adoption, most empirical studies focus primarily on firm-level or individual-level acceptance processes. Cross-country analyses examining how national AI development capacity corresponds with sustainability performance remain comparatively limited (Dwivedi et al., 2021). Whether advancements in AI systematically align with improvements in environmental performance remains an open empirical question, particularly across countries with diverse institutional and economic structures. Accordingly, the aim of this study is to comparatively examine how national AI development capacity corresponds with sustainability performance in the United States, South Korea and Türkiye, based on internationally reported indicators covering the last decade and including the most recent available data. The study seeks to address the following research question: *How does national AI development capacity correspond with sustainability outcomes across countries with different technological and institutional characteristics?* This study contributes to literature in three main ways. First, it contributes to extending technology acceptance discussions from individual-level behavioral models toward a macro-national comparative perspective. Second, it integrates AI development indicators with sustainability performance measures within a structured cross-country analytical framework. Third, it provides policy-relevant insights that may support the alignment of digital transformation strategies with environmental and energy transition objectives.

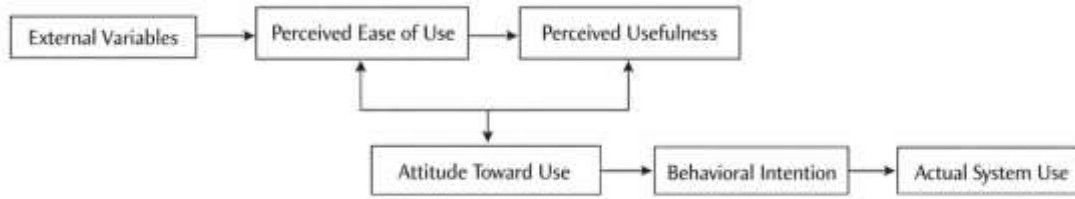
2. LITERATURE REVIEW

2.1. Theoretical Framework and Technology Acceptance Model (TAM)

Technology acceptance has emerged as a central research field seeking to explain how individuals adopt, use and integrate new technologies into their daily and professional practices. Among the most influential theoretical frameworks in this domain is the Technology Acceptance Model (TAM), originally proposed by Davis (1989). TAM posits that technology adoption is primarily determined by two core perceptions: perceived usefulness and perceived ease of use. These perceptions shape users' behavioral intentions, which in turn influence actual technology utilization (Venkatesh & Davis, 2000).

Over time, TAM has been extended to accommodate more complex technological and social environments. TAM2 introduced additional determinants such as social influence and cognitive instrumental processes, while the Unified Theory of Acceptance and Use of Technology (UTAUT) integrated constructions including facilitating conditions, performance expectancy, effort expectancy and social norms (Venkatesh et al., 2003). These extensions enhanced the explanatory power of technology acceptance models, particularly in organizational contexts. Despite their robustness at the individual level, TAM and its extensions have been criticized for their limited capacity to explain technology diffusion at broader structural levels. Large-scale technological transformations are influenced not only by user perceptions but also by institutional frameworks, regulatory environments, national innovation systems and infrastructural readiness (Venkatesh et al., 2016). In macro-level contexts, technology adoption is shaped by policy coordination mechanisms, governance capacity and socio-economic structures that extend beyond individual behavioral determinants. These limitations become particularly evident in the context of artificial intelligence. Unlike earlier information systems, AI technologies often involve autonomous decision-making processes, algorithmic opacity and data-intensive infrastructures. Such characteristics introduce governance, ethical and societal implications that cannot be fully captured through traditional usability and perception-based constructs (Dwivedi et al., 2021). Trust in algorithms, transparency of decision systems, accountability mechanisms and institutional oversight become central determinants influencing AI diffusion across sectors and national systems. With the increasing prevalence of digitalization, automation and data-driven systems, technology acceptance frameworks have gradually evolved to encompass so-called "smart technologies," emphasizing dimensions such as trust, transparency, ethical responsibility and system autonomy (Marangunić & Granić, 2015; Shankar & Datta, 2022). However, understanding AI adoption requires moving beyond individual-level acceptance models toward multi-level frameworks that incorporate individual, organizational, institutional and societal dimensions simultaneously. Therefore, while TAM provides a valuable conceptual foundation for understanding technology adoption behavior, its explanatory scope remains limited when addressing national-level AI development and sustainability outcomes. The present study builds upon this theoretical foundation while extending the analytical perspective toward macro-level technological capacity and its potential alignment with environmental performance indicators. To illustrate the conceptual roots of technology adoption research, the core components of TAM are presented in Figure 1.

Figure 1: Technology Acceptance Model (TAM)



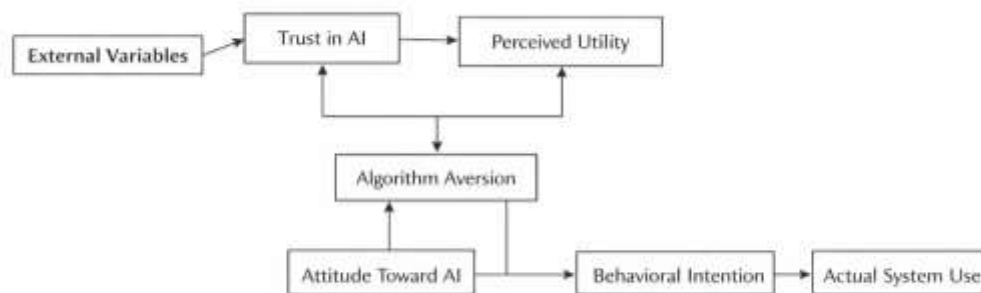
Source: (Davis, 1989).

2.2. Theoretical Framework and Artificial Intelligence Acceptance Model (AIAM)

The Artificial Intelligence Acceptance Model (AIAM) represents an emerging conceptual extension within technology acceptance research that seeks to address the distinctive characteristics of AI-driven systems. Rather than constituting a fully institutionalized or standardized theoretical model, AIAM reflects an evolving body of literature that adapts traditional acceptance frameworks to the specific features of artificial intelligence technologies. Unlike earlier information systems, AI-based technologies involve algorithmic autonomy, data-intensive infrastructures and often opaque decision-making processes. These characteristics introduce new determinants of acceptance that extend beyond perceived usefulness and ease of use. Research increasingly emphasizes the role of trust in algorithms, perceived fairness, explainability, accountability mechanisms and ethical awareness in shaping individuals’ willingness to adopt AI systems (Glikson & Woolley, 2020; Longoni et al., 2022). When AI-generated decisions are perceived as transparent, reliable and aligned with ethical standards, acceptance levels tend to increase. A key analytical distinction between traditional technology acceptance models and emerging AI acceptance perspectives lies in their scope. While TAM and its extensions primarily focus on individual-level perceptions and behavioral intentions, AI acceptance increasingly requires multi-level consideration. The diffusion of AI technologies is influenced not only by user cognition but also by institutional readiness, digital infrastructure capacity, regulatory frameworks and national innovation ecosystems (OECD, 2024). In this context, AI adoption reflects governance capacity, policy coordination and the broader socio-technical environment within which AI systems operate. This multilevel dimension is particularly important because AI technologies frequently shape critical infrastructures, including energy systems, public administration, healthcare and financial services. At the macro level, AI capacity may influence sustainability performance through data-driven resource optimization, smart grid management, predictive environmental monitoring and efficiency-enhancing automation. However, such outcomes depend on institutional capacity, strategic alignment and regulatory oversight rather than on technological investment alone. Empirical studies applying AI acceptance perspectives have predominantly examined sectoral contexts such as banking, healthcare, education and public services (Sturm et al., 2023).

Yet, cross-country investigations exploring how national AI development capacity corresponds with sustainability performance remain limited. This gap is particularly relevant because AI-driven transformation may generate heterogeneous environmental outcomes depending on governance structures and technological maturity levels. Accordingly, AIAM should be understood as an evolving conceptual framework that extends traditional technology acceptance theories by integrating algorithmic characteristics, ethical considerations and institutional determinants. In the context of the present study, AI acceptance is approached not solely as an individual behavioral phenomenon but as a national-level capacity embedded within broader innovation and governance systems. The conceptual structure of the Artificial Intelligence Acceptance Model (AIAM) is presented in Figure 2.

Figure 2: Artificial Intelligence Acceptance Model (AIAM)



Source: (Glikson & Woolley, 2020; Longoni et al., 2022).

2.3. Relationship between Artificial Intelligence and Sustainability

Artificial intelligence (AI) has increasingly been recognized as a transformative technological force with the potential to influence multiple dimensions of sustainable development. International organizations emphasize that AI applications may contribute directly or indirectly to a substantial number of Sustainable Development Goals (SDGs), particularly in areas such as energy efficiency, climate action, industrial innovation and responsible resource management (United Nations, 2023; UNESCO, 2023). However, the extent to which AI contributes to sustainability depends on structural, institutional and technological conditions within national contexts. From a functional perspective, AI technologies may support sustainability through several mechanisms. First, data-driven optimization systems can enhance energy efficiency by improving demand forecasting and enabling smart grid management. Second, predictive analytics may assist in monitoring carbon emissions, detecting environmental risks and optimizing industrial production processes. Third, AI-based automation can increase resource efficiency by minimizing waste and improving operational precision (IEA, 2024). These mechanisms suggest a potential alignment between technological advancement and environmental performance. Nevertheless, the relationship between AI and sustainability is not automatically positive. AI infrastructures themselves require substantial computational power and energy consumption, particularly in large-scale data centers. Moreover, unequal access to digital infrastructure and advanced technical skills may limit the sustainability benefits of AI in developing or structurally constrained economies (World Bank, 2024). Therefore, AI's environmental contribution is mediated by governance quality, regulatory oversight, digital maturity and institutional coordination capacity. Cross-country differences illustrate this variability. According to the Stanford AI Index (2024), AI-related research and development expenditures reached approximately USD 330 billion in the United States in 2023, compared to roughly USD 47 billion in South Korea and about USD 6.5 billion in Türkiye. These disparities reflect varying national capacities to integrate AI into industrial systems, energy infrastructures and environmental management processes. In technologically advanced contexts, AI-supported systems are more frequently associated with improvements in energy efficiency and emission monitoring, whereas in emerging economies structural constraints—such as limited digital infrastructure, restricted data accessibility and shortages of advanced digital skills—may weaken this association. In Türkiye, for instance, although strategic initiatives and policy frameworks related to artificial intelligence have expanded in recent years (TÜBİTAK, 2023), the integration of AI into production systems and environmental governance mechanisms remains comparatively gradual. Consequently, improvements in carbon intensity and environmental performance indicators appear more moderate relative to technologically mature economies. Taken together, the relationship between AI and sustainability should be understood as conditional rather than deterministic. AI development capacity may correspond with improved sustainability performance when supported by institutional readiness, coordinated policy implementation and adequate digital infrastructure. This conditional perspective aligns with emerging AI acceptance frameworks that emphasize multi-level determinants of technology diffusion, extending analysis beyond individual adoption toward national-level structural capacities.

2.4. Comparative Analysis of the US, South Korea and Türkiye

The United States, South Korea and Türkiye represent three distinct positions within the global technological landscape, offering analytically meaningful variation in terms of innovation capacity, digital infrastructure and institutional maturity. The selection of these cases enables structured comparison across advanced, research-intensive and emerging technological contexts, thereby facilitating examination of how national AI development trajectories correspond with sustainability performance under differing structural conditions. The United States maintains a leading global position in artificial intelligence innovation, accounting for more than 40% of worldwide AI-related patents and demonstrating high levels of scientific publication output (OECD, 2024). Its advanced digital infrastructure, mature capital markets and strong university–industry collaboration systems provide a conducive environment for large-scale AI deployment. South Korea similarly ranks among the world's most research-intensive economies, with research and development expenditures reaching approximately 4.9% of GDP (OECD, 2024). The country combines strong industrial policy coordination with advanced manufacturing capabilities and rapidly expanding digital ecosystems, positioning it as a technologically sophisticated yet structurally distinct case from the United States.

Türkiye, by contrast, represents an emerging technological economy undergoing institutional and infrastructural transformation. Through the implementation of the National Artificial Intelligence Strategy (TÜBİTAK, 2023), Türkiye has sought to strengthen its AI ecosystem, expand digital competencies and enhance innovation capacity. However, differences in research intensity, technological infrastructure and capital availability distinguish Türkiye from the two more research-intensive economies. These structural differences are particularly relevant in the context of sustainability alignment. Advanced technological capacity may facilitate the integration of AI into energy systems, industrial efficiency processes and environmental monitoring mechanisms. However, the translation of AI investment into sustainability outcomes depends on institutional coordination, governance quality and digital readiness. Therefore, cross-country comparison provides an opportunity to examine whether higher AI development capacity systematically corresponds with stronger sustainability performance or whether contextual factors mediate this relationship. Existing studies frequently focus on sector-specific AI adoption patterns or firm-level analyses (Dwivedi et al., 2021; Longoni et al., 2022), while comparative national-level examinations remain limited. By positioning these three countries within a common analytical framework grounded in macro-level technology acceptance perspectives, the present study contributes to understanding how AI development capacity interacts with sustainability performance across heterogeneous institutional

contexts. A comparative summary of technological capacity, AI investments and sustainability-related indicators for the three countries examined in this study is presented in Table 1.

Table 1: Comparative Indicators of AI and Innovation Capacity: United States, South Korea and Turkiye

Latest Available Data	United States	South Korea	Turkiye
Share in Global AI Patents (%)	>40%	High global ranking	Limited share
R&D Expenditure (% of GDP)	≈3.5%	≈4.9%	≈1.3%
AI R&D Investment (2023, USD)	≈330 billion	≈47 billion	≈6.5 billion
AI Policy Framework	Advanced national AI ecosystem and strong private sector leadership	Strong state-led innovation and digital transformation policies	National AI Strategy implemented in 2021
Industrial AI Integration	Extensive adoption across sectors	Strong adoption in manufacturing and digital industries	Integration expanding but still limited
Renewable Energy Growth (2010–2022)	+20%	+14%	+10%
Carbon Intensity Change (2010–2022)	–18%	–9%	–5%
Overall Position in Study	Technological leader	Innovation-intensive economy	Emerging digital economy

Source: OECD (2024), Stanford AI Index (2024), World Bank (2024), IEA (2024), TÜBİTAK (2023); compiled by the authors.

3. DATA AND METHODOLOGY

This section outlines the research design, data sources, sampling strategy and analytical procedures employed to examine the relationship between national artificial intelligence (AI) development capacity and sustainability performance. The study adopts a structured comparative approach based entirely on secondary macro-level data obtained from internationally recognized institutions. The methodological framework is designed to ensure cross-country comparability, conceptual consistency with the theoretical framework and analytical transparency.

3.1. Research Design and Data Collection

This study employs a structured comparative descriptive research design to examine how national artificial intelligence (AI) development capacity corresponds with sustainability performance across countries at different stages of technological maturity. The objective is not to test causal hypotheses but to identify associative patterns and structural differences at the macro level. The comparative approach enables systematic evaluation of cross-country variations in AI investment, innovation capacity and sustainability indicators. Such macro-level comparative analyses are widely used in technology policy and sustainability research to assess developmental trajectories across heterogeneous institutional contexts (Ragin, 2014). The United States, South Korea and Turkiye were selected purposively to represent distinct technological profiles: a global innovation leader, a research-intensive industrial economy and an emerging technological economy undergoing institutional transformation.

3.2. Data Sources and Variables

This study is based on macro-level secondary indicators related to national artificial intelligence (AI) development and sustainability performance. Rather than defining a conventional statistical population, the research draws upon internationally reported country-level datasets that enable cross-national comparison. The analytical sample consists of three purposively selected countries: the United States, South Korea and Turkiye. These countries were chosen to represent different levels of technological maturity, AI development capacity and institutional readiness. The United States reflects a globally leading innovation ecosystem characterized by high R&D intensity and extensive AI-driven industrial applications (Stanford AI Index, 2023). South Korea represents a research-intensive economy with advanced digital infrastructure and strong governmental coordination in AI strategy (OECD, 2024; IEA, 2024). Turkiye is included as an emerging technological economy strengthening its AI capacity through national strategies and institutional reforms (TÜBİTAK, 2023; World Bank, 2024).

This purposive case selection enables structured comparison across heterogeneous technological contexts, allowing examination of how differences in AI development capacity correspond with sustainability performance. The use of internationally standardized indicators ensures cross-country comparability and enhances the reliability of the analytical framework.

3.3. Limitations

The study has several limitations. First, the study relies exclusively on secondary international datasets, limiting the scope of variables to publicly reported indicators. Second, the inclusion of only three countries restricts broader generalization. Third, sustainability assessment focuses primarily on environmental indicators, while economic and social sustainability dimensions are addressed to a more limited extent. Finally, variations in reporting periods across international databases may introduce minor temporal inconsistencies. Despite these limitations, the selected cases provide analytically meaningful variation for examining how AI development capacity corresponds with sustainability performance across different institutional contexts.

3.4. Data Analysis Methods

In this study, data analysis was conducted using a structured cross-country comparative approach. This method is appropriate for examining macro-level differences in artificial intelligence (AI) development capacity and sustainability performance across countries with heterogeneous technological and institutional characteristics. The analysis relies on standardized country-level indicators obtained from internationally recognized databases (OECD, 2024; World Bank, 2024; IEA, 2024; Stanford AI Index, 2023). Indicators were selected to represent two primary analytical dimensions:

- AI development capacity (e.g., R&D intensity, AI investment levels, patent output, technological readiness)
- Sustainability performance (e.g., carbon intensity trends, renewable energy consumption share, environmental performance indicators).

The analytical procedure consisted of three stages. First, AI-related indicators were compiled and harmonized to ensure cross-country comparability. Second, sustainability indicators were comparatively examined to identify relative positioning and directional trends across countries. Third, a qualitative alignment assessment was conducted to evaluate whether higher levels of AI development capacity correspond with stronger sustainability performance. The study does not employ econometric modeling or causal inference techniques. Instead, it relies on structured comparative interpretation of macro-level indicators. Accordingly, the findings reflect associative and conditional patterns rather than causal relationships.

4. FINDINGS AND DISCUSSIONS

This section presents the comparative findings of the study based on internationally reported indicators related to artificial intelligence development and sustainability performance across the selected countries. First, differences in AI development capacity among countries are examined. Second, sustainability performance indicators are compared. Finally, the alignment between technological development and sustainability outcomes is evaluated to identify similarities and divergences among countries. Accordingly, Table 2 presents a comparative overview of the AI and innovation capacities of the United States, South Korea and Turkiye, forming the basis for interpreting subsequent sustainability performance differences across countries.

Table 2: Comparative Overview of the AI and Innovation Capacities

	United States	South Korea	Turkiye
Share in Global AI Patents	Over 40% of global AI patents	High global ranking	Limited share
R&D Expenditure (% of GDP)	≈ 3.5%	≈ 4.9%	≈ 1.3%
AI R&D Investment (2023)	≈ USD 330 billion	≈ USD 47 billion	≈ USD 6.5 billion
National AI Policy Framework	Advanced AI ecosystem with strong private sector leadership	Strong state-supported innovation and digital transformation policies	National AI Strategy implemented in 2021
Industrial AI Integration	Extensive cross-sector adoption	Strong integration in manufacturing and digital industries	Expanding but still limited integration
Overall Innovation Capacity	Very high	High	Developing

Table 2 demonstrates clear differences among the three countries in terms of artificial intelligence and innovation capacity. The United States maintains a leading global position, particularly in AI patent production and investment levels, reflecting a mature and innovation-driven ecosystem supported by strong private sector involvement. South Korea also exhibits strong innovation performance, especially through its high R&D expenditure relative to GDP and strong industrial integration of advanced technologies. In contrast, Turkiye represents an emerging AI ecosystem where investments and institutional frameworks have recently expanded, yet industrial-level adoption and innovation outputs remain comparatively limited. These differences suggest that the countries operate at distinct stages of technological maturity, which is likely to influence how effectively AI technologies

contribute to sustainability outcomes examined in subsequent analyses. Accordingly, Table 3 presents a comparative overview of sustainability performance indicators for the selected countries.

Table 3: Comparative Sustainability Performance Indicators

Indicator	United States	South Korea	Turkiye
Carbon Intensity Change (2010–2022)	–18%	–9%	–5%
Renewable Energy Consumption Growth (2010–2022)	+20%	+14%	+10%
Environmental Performance Trend	Continuous improvement	Moderate improvement	Gradual improvement
Integration of Clean Energy Technologies	High adoption level	Increasing adoption	Developing adoption level
Overall Sustainability Performance	High	Moderate	Developing

Table 3 compares sustainability performance indicators across the selected countries and reveals differing levels of environmental progress. The United States demonstrates the strongest improvement in both carbon intensity reduction and renewable energy expansion, reflecting broader adoption of clean energy technologies and environmental management policies. South Korea also shows measurable progress, although reductions in carbon intensity and renewable energy expansion remain more moderate compared to the United States. Turkiye exhibits gradual improvements; however, sustainability performance gains remain comparatively limited, partly due to ongoing structural and energy transition challenges. Overall, the results suggest that countries with stronger technological and innovation capacities tend to achieve more significant sustainability improvements, although progress remains uneven across national contexts. Accordingly, Table 4 presents a comparative assessment of the alignment between AI development capacity and sustainability outcomes in the selected countries.

Table 4: Alignment Between AI Development Capacity and Sustainability Outcomes

Country	AI Development Capacity	Sustainability Improvement Level	Alignment Assessment
United States	High	Strong improvement	Strong alignment
South Korea	High	Moderate improvement	Partial alignment
Turkiye	Developing	Limited improvement	Emerging alignment

Table 4 illustrates how differences in AI development capacity correspond to sustainability performance across countries. The United States demonstrates both high AI capacity and strong improvements in sustainability indicators, suggesting a strong alignment between technological advancement and environmental performance. South Korea also exhibits high AI development capacity; however, sustainability improvements appear more moderate, indicating partial alignment between technological development and sustainability outcomes. In contrast, Turkiye’s developing AI ecosystem corresponds with more limited sustainability progress, reflecting an emerging but not yet fully realized alignment between technological development and environmental performance. These findings indicate that while higher AI capacity often coincides with better sustainability outcomes, the strength of this relationship varies depending on institutional capacity, policy implementation and structural conditions. Accordingly, Table 5 presents a general comparative summary combining technological and sustainability performance indicators.

Table 5: General Comparative Summary of AI Development and Sustainability Performance

Country	AI Development Capacity	Innovation Performance	Sustainability Performance	Overall Development Pattern
United States	High	Very high	High improvement	Technological and sustainability leader
South Korea	High	High	Moderate improvement	Innovation-driven transition economy
Turkiye	Developing	Moderate	Limited improvement	Emerging digital transformation economy

Table 5 summarizes the comparative positions of the three countries examined in the study. The United States demonstrates strong performance in both technological development and sustainability outcomes, positioning it as a leader in aligning innovation capacity with environmental performance. South Korea shows strong innovation capacity but more moderate

sustainability improvements, indicating an ongoing transition toward stronger sustainability outcomes. Türkiye, while making progress in technological development through national AI strategies and digital transformation initiatives, still exhibits comparatively limited sustainability improvements. Overall, the comparison suggests that technological capacity and sustainability performance tend to evolve together, yet the pace and effectiveness of this alignment differ according to countries' institutional, economic and policy conditions. The findings obtained in this study indicate that there is a meaningful relationship between artificial intelligence (AI) development capacity and sustainability performance at the country level. When the table results are evaluated together, it becomes evident that countries with higher AI investments and stronger innovation capacity achieve more visible progress in sustainability indicators. In particular, the strong performance of the United States in both AI patent production and investment capacity, as well as in reducing carbon intensity and increasing renewable energy use, demonstrates that technological development can progress in parallel with environmental performance. Similar trends are also observed in the literature. Reports published by the OECD and the World Bank indicate that digitalization and AI investments in developed countries contribute positively to improvements in energy efficiency, production optimization and resource utilization. Likewise, Dwivedi et al. (2021) emphasize that advanced digital technologies generate transformative effects not only economically but also environmentally. Similarly, IEA reports show that smart energy management systems and data-driven optimization play an important role in reducing energy consumption. However, the results of the study also reveal that technological capacity does not automatically translate into sustainability performance. In the case of South Korea, despite high R&D expenditure and strong digital infrastructure, improvements in sustainability indicators are not as rapid as those observed in the United States. This suggests that not only technological capacity but also energy policies, sectoral structure and implementation processes play decisive roles. In the case of Türkiye, despite national AI strategies and ongoing digital transformation policies, improvements in sustainability performance remain comparatively limited. This finding confirms the importance of factors frequently emphasized in literature, such as infrastructure readiness, data management, technology adaptation and institutional implementation capacity. As noted by Longoni et al. (2022), technology adoption is not only a matter of technological investment but is also closely related to institutional and societal acceptance processes. Overall, the discussion demonstrates that the relationship between AI investments and sustainable development is not linear but is shaped by factors such as policy implementation, institutional capacity and economic structure. Although technological capacity represents an important tool for sustainability, it is not sufficient on its own.

5. CONCLUSION AND IMPLICATIONS

This study comparatively examined how national artificial intelligence (AI) development capacity corresponds with sustainability performance in the United States, South Korea and Türkiye. By integrating indicators related to AI investment, innovation intensity and environmental performance, the analysis aimed to provide a macro-level perspective on the alignment between technological transformation and sustainability outcomes. The findings suggest that higher levels of AI development capacity are generally associated with stronger sustainability performance; however, this relationship is conditional rather than automatic. The United States demonstrates a relatively strong alignment between technological advancement and environmental improvement. South Korea exhibits high innovation capacity, yet sustainability gains appear more moderate, indicating that technological sophistication alone may not guarantee proportional environmental outcomes. Türkiye, while strengthening its institutional AI framework, shows comparatively gradual sustainability improvements, reflecting structural and infrastructural constraints. Across cases, the results highlight that institutional capacity, regulatory coordination, digital infrastructure and energy transition policies play a critical mediating role in translating technological investment into environmental performance. The relationship between AI development and sustainability is therefore neither linear nor uniform. Rather, it depends on the extent to which innovation strategies are integrated with environmental and sectoral transformation policies. From a policy perspective, AI investment should be considered not only as a competitiveness strategy but also as a component of long-term sustainability planning. Coordinated policy frameworks that align digital transformation with environmental regulation and green transition objectives appear more likely to generate balanced technological and sustainability outcomes. The study contributes to the literature by extending technology acceptance discussions beyond individual and organizational contexts toward national-level technological transformation and sustainability alignment. Nevertheless, the findings should be interpreted within the limits of a descriptive comparative design. The analysis identifies associative patterns rather than causal relationships. Future research may expand the comparative scope, incorporate additional countries and apply longitudinal or econometric methods to further investigate the mechanisms linking AI development and sustainability performance. In conclusion, artificial intelligence represents a strategic opportunity for sustainable development. However, effective alignment between AI capacity and environmental progress requires integrated governance structures, institutional readiness and coordinated long-term policy frameworks.

Future Research Directions

- Future research could utilize panel data models covering longer time periods to assess the long-term impacts of AI investments on sustainability.
- Studies may analyze AI acceptance using sector-specific datasets (e.g., energy, agriculture, finance, healthcare) to uncover micro-level differences.

- National AI strategies could be examined alongside green transformation policies to evaluate the effects of policy alignment on sustainability outcomes.
- Future studies could conduct causality analyses by comparing firms' levels of AI acceptance with their environmental performance.
- The mediating roles of cultural values, governance quality and institutional trust in the relationship between AI acceptance and sustainability could be investigated. Exploring both economic and socio-cultural determinants of AI adoption would provide a significant contribution to the literature.

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ASSESSING THE IMPACT OF WORK OVERLOAD, WORK STRESS AND EMPLOYEES' BURNOUT ON EMPLOYEES' MENTAL HEALTH: WORK-LIFE CONFLICT MEDIATING

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ABSTRACT

Purpose- The aim of this study is to assess the impact of work overload, work stress, and employees' burnout on employees' mental health mediated by work-life conflict.

Methodology- The study was a survey design using a quantitative approach. The research instrument was structured questionnaire. 15 out of 20 listed consumer goods were studied with a sample size of 375. A structured questionnaire was administered with the view of gathering primary data for statistical analysis. The data was analyzed using PLS-SEM.

Findings- The findings revealed that work overload and employees' burnout have a direct impact on employees' mental health, while work stress has an indirect impact on employees' mental health. Work-life conflict mediated their relationship, but employees' burnout was not affected by work-life conflict. It was concluded that employees should be given realistic targets to reduce workload, work stress, burnout, and associated work-life imbalance that catalyzes mental health disorders among employees of manufacturing firms in Nigeria.

Conclusion- Managers and policy makers should prioritize employees' mental health and wellbeing by reducing stressors that cause work-life conflicts through occupational health and safety policy in order to enjoy work-life balance. Reducing stressors in the workplace will improve employees' mental health and their productivity thereby enhancing work-life balance

Keywords: Work overload, work stress, employees' burnout, work-life conflict employees' mental health, Nigeria.

JEL Codes: M12, J22, 112

1. INTRODUCTION

Over the years, work demands have increased significantly in all sectors of the economy, particularly in manufacturing sectors, due to global competition and the need to increase output and maximize profit for the shareholders. This has put much job pressure and anxiety on workers, which many now struggle to balance with their family responsibilities (Nwafili, 2024a). This demanding nature of the modern workplace has the capacity to impair employees' mental health and well-being (Pitt et al., 2021). The consumer goods industry in Nigeria marked by intense demand and cutthroat competition are not exempted as they put much pressure on workers in order to meet these expectations (Fanisi, 2024). This pressure on workers may cause them to use up their resources on work domain, with little or none left for the family domain resulting in conflict. This conflict may lead to psychological distress, depression, anxiety, stress, and burnout, impacting on employees' wellbeing (Ugwu, et al, 2024).

With the available finite resources, workers are overburdened with tasks that are difficult to complete within the allotted time (Simon, 2023). This causes stress (Williams et al., 2021) and associated burnout (Yildirimer, 2023). Work overload, work stress, and work burnout are of great concern to workers due to their association with work-life conflict. Work-life conflict occurs when employees fail to perform their roles due to a mismatch of work and family demands (Taufik & Sunaryo, 2021). To maintain emotional and psychological well-being, employees are expected to balance work responsibilities and family responsibilities (Nwafili, 2024b).

The increasing rate mental health disorder faced by workers makes it expedient for appropriate attention by government through occupational health and safety framework (Akinbode et al., 2018). This is important to curtail the escalating mental health issues and to avoid further public health challenges (Agboola et al., 2020). However, emphasis has been shifted from solely treating mental disorders to prioritizing overall mental health and well-being (Gautam et al. 2024). This has become indispensable given the huge amount spent annually to address mental health cases globally which is put at USD 1 Trillion and the workplace stressors endemic in Nigeria (Babatope, et al, 2023). According to the World Health Organization (2024),

around 15% of workers had mental health disorders in 2019, resulting in loss of productivity. Consequently, this study attempts to this scholarly debate with empirical insights from Nigeria to complement international perspectives of these interconnected relationship of these stressors and supports (Nwagbara, 2020)

Although, existing literature investigated the relationship between occupational stress and mental illness in other sectors, which is inadequate (Oginni, et al, 2023), requiring further investigations to cover up consumer goods sector in Nigeria. Likewise, despite the concern of workers regarding work overload, work stress, and burnout, occasioned by work-life conflict, there exists insufficient literature on the interdependency of these variables in the Nigerian context, thereby necessitating this study in order to bring out strategies for promoting employees' well-being and productivity in the manufacturing sector. Therefore, the essence of this research is to investigate the complex relationship between work overload, work stress and employees' burnout as it affects employees' mental health, with the mediating role of work-life conflict in consumer goods firms in Nigeria. Specifically, the purpose of this study is to fill the mentioned literature gap by addressing the interactions under which the requirement to meet certain output level in form of target by most consumer goods firms exacerbate burnout and other mental health related problems (Fanisi, 2024). This has particular importance as work overload often triggers psychological ill-health outcomes such as behaviour stress and burnout which impact negatively on organizational commitment, employees' health and wellbeing (Babatope, et al, 2023). Previous studies have shown that work overload intensify work related problems and stress, yet the role and the extent of work-family conflict on job stress have not been adequately researched (Noordin, et al, 2023). Work-family conflict being an inter-role conflict existing between work role and family role can be categorized as time based, strain based and behaviour based and this was identified as a strong predictor of job stress (Ganewatta & Hiroshima, 2023). This potentially results in burnout and diminished mental wellbeing especially in industrial set up (Khan, et al, 2022). The psychosocial workload comprising various demands and stressors increase the conflict thereby necessitating further research on the psychological implications of these relationships (Akinbode, et al, 2018). Hence, it is imperative to investigate the mediating role of work-family conflict on the relationship between work overload, job stress and employee burnout so as to find solution that reduce negative mental health problems in Nigerian manufacturing sector. This seems to be particularly relevant in the Nigerian context where growing unemployment may facilitate an exploitative industrial environment where employees may be less inclined to address the issue of counterproductive work behaviours arising out of workload and unfairness (Nnaebue et al., 2020). As such, careful investigation of this phenomenon is crucial.

2. LITERATURE REVIEW

2.1. Conceptual Review

2.1.1. Employees Mental Health (EMH)

The term 'mental health' has been misunderstood for mental health disorder and as such, when people hear mental health, their mind goes to psychiatric illness (Hibaoui & Naji, 2024). However, this misconception has been demystified by scholars who conceptualized it in different perspectives. According to World Health Organization, (2022), mental health is defined as a state of wellbeing that allows individuals to navigate life challenges, maximize their potentials and contribute meaningfully to the society. Mental health encompasses emotional, psychological, and social aspects of life, impacting on individual's thoughts, feelings, and actions, and enhancing stress management, relationships building, and decision making (International Organization of Employees, 2023). It is required of employees to enable them work effectively in a work setting (Fortunisa, & Darmawan, 2022). In other words, employees' mental health does not only affect the individuals but also the organizational output and quality of life (Bajaj, 2023). Mental illness results in low commitment and performance, habitual lateness and absence, and high attrition rate, thereby impacting of overall organizational productivity (Bakker & Demerouti, 2007). Mental health illness manifests in different forms such as inability pay attention, exhaustion, and low passion for the job which negatively affect their performance and general output (Stratton et al, 2022).

However, high rate of mental health crisis within an organization can heightened spending on healthcare and more workplace related accidents (Singh & Bhuvanewari, 2023). It is expected of organizations to look into mental health in workplaces holistically to identify the causes, to enable it solve the problems, as prevention is better than cure. Alternatively, focusing on and promoting mental health is crucial for adaptability, employees' engagement, and facilitating job satisfaction, leading to efficiency and effectiveness in the system (Bakker & Demerouti, 2007). Organizational support is essential in improving physical and mental health, thereby influencing both employees and the overall organizational performance (Chang, 2024). This has resulted in the designing of frameworks for helping employees overcome workplace related challenges that are pro-mental health in the organization (Bajaj, 2023). This support helps solve employees' mental illness and prevent occurrence, leading to organizational effectiveness (Wang & Sheibani, 2024).

2.1.2. Work Overload (WO) and Employee Mental Health (EMH)

The term "work overload" describes the state in which a person or group is overburdened with more work than they can possibly complete within a given time period (Simon, 2023). It refers to an excessive amount of work completed in the allotted

period or work that is too challenging for staff members (Andriani & Disman, 2023). In the opinion of Matyska (2024), it implies a situation where an individual is assigned more job-related responsibilities, tasks, or projects than he or she can effectively and efficiently handle.

Work overload may result in detrimental effects on workers' health, such as elevated stress levels and burnout, and negatively affect productivity and job satisfaction (Dewi et al., 2021). It is believed that work overload affects the physical, mental, and emotional stress, which impacts the general well-being of employees and organizational performances (Nwafili et al., 2024). Accordingly, Al-Qahtani et al. (2015) found that a productivity-driven approach essentially compromises overall quality and organizational efficacy. Studies have shown that overemphasis on output results in work overload, which in turn causes stress, burnout, absenteeism, and possible turnover (Simon, 2023). Andriani and Disman (2023) noted that the organization, work environment, and task or job demands can all contribute to workload. Also, global competition and the need to gain a competitive advantage may cause work overload as well (Nwafili et al., 2024).

However, some common causes of work overload are unrealistic expectations, constant interruptions, inadequate delegation, poor task management, tight deadlines, and inadequate resources or support (Simon, 2023). Prolonged working hours can lead to stress and burnout, which can have a detrimental influence on effectiveness, interpersonal relationships, and mental and psychological health (Yildirimer, 2023). Additional factors that can contribute to work overload include demands placed on one's job, office politics, lack of support, job insecurity, a poor work-life balance, and lack of acknowledgement, imprecise expectations, poor communication, and a lack of control (Davenport, 2024). Managing overload may not be cost-effective but is very necessary, as the cost of managing psychological trauma or mental health may be devastating. Therefore, organizations are expected to avoid work overload, as it has a significant effect on employees' mental health (Yildirimer, 2023; Singh, 2024). According to Williams et al. (2021), excessive workload can lead to stress, impacting adversely on both physical and mental health.

H01: There is no positive significant impact of work overload on employees' mental health.

2.1.3. Work Stress (WS) and Employee Mental Health (EMH)

Job stress, occupational stress, and work stress are often used to describe the same situation (Aziz, 2024). Stress occurs when employees feel consumed by job demands that are above their ability to cope, leading to physical and emotional strain (International Labour Organization, 2016). According to the World Health Organization (WHO), cited in Maulik (2017), when demands and pressures from the workplace surpass a person's knowledge, skills, and ability to cope, stress results. This implies that the mismatch between job responsibilities and an employee's knowledge and skills is referred to as work stress. That means that employees with limited knowledge and skills will likely face stress in their workplaces. Abdou et al. (2024) describes work stress as an unfavorable experience encountered by employees when they lack the necessary skills and abilities to handle job pressure efficiently and effectively. Stress can impair a person's overall performance, productivity, and well-being, both physically and mentally (Aziz, 2024). Various workplace conditions can cause emotions of pressure, tension, and emotional strain, which are characteristics of job stress (Fortes et al., 2020). Employees that struggle to finish tasks due to time constraints, heavy workloads, and other constraints experience stress (Khan & Khurshid, 2017). Lou et al. (2021) stated that work stress can be categorized broadly into two types: challenge stress (positive) and hindrance stress (positive). The key stressors identified by Magesa and Mtey (2024) include overwhelming workload, adjusting to new work environments, and work-life balance challenges. Other stressors are conflicting roles, unclear expectations, unmanageable workload, poor working conditions, and strained interpersonal relationships in the workplace (Niere et al., 2023).

Workplace stress is prevalent and can negatively affect employees' mental and physical well-being (Hasin et al., 2023). Chen et al. (2022) found a negative relationship between work stress and employees' performance and a positive relationship between work stress and employees' health.

H02: There is no positive significant impact of work stress on employees' mental health.

2.1.4. Employee Burnout (EB) and Employee Mental Health (EMH)

Burnout is a state of emotional, mental, and physical exhaustion caused by prolonged workplace stress, leading to feelings of frustration and isolation (Farshchi & Aghighi, 2022). It involves exhaustion, impaired functioning, and emotional detachment (Abdul-Aziz & Ong, 2024). According to the World Health Organization (2019), burnout is a condition of psychological, emotional, and physical exhaustion that is caused by prolonged stress at the workplace that has not been properly managed. It is a prolonged response to ongoing job stress (Gabriel & Aguinis, 2022), and it impairs an employee's job performance (Jaber & Al-Zoubi, 2012). Intense work demands in a globalized market can cause job burnout (Zeng & Hu 2024). Kumareswaran (2023) identified three key signs of burnout, including emotional exhaustion, depersonalization, and lack of personal accomplishment. Burnout may trigger or worsen mental health challenges, particularly for vulnerable individuals (Adanaqué-Bravo, et al., 2023). Hasin et al. (2023) posited that a positive and significant relationship exists between burnout and employees' mental health.

H03: There is no positive significant impact of work burnout on employees’ mental health.

2.1.5. Relationship between Work Overload (WO), Work Stress (WS), Employees’ Burnout (EB), and Work-Life Conflict (WLC)

Work-life conflict refers to role incompatibility (Nwafili, 2024a). It arises when work duties clash with family obligations (Chaudhry et al., 2011). Hou and Jiang (2023) define it as the incompatibility of work and personal life demands, making it hard to balance both. A mismatch of work and family demands, hindering the performance of both, is referred to as work-family conflict (Taufik & Sunaryo, 2021). It occurs as a result of interference between work responsibilities and household responsibilities (Pitt et al., 2021).

As stated by Simon (2023), the fallout of work overload is work stress, employees’ burnout, absenteeism, and turnover, highlighting a connection between excessive workload, stress, and employee burnout. Work overload is linked to increased work-family conflict (Bas & Guney, 2022); work-family conflict is linked to work stress (Abraham, 2024); and there is a positive correlation between work-family conflict and employee burnout (Wu et al., 2018). When employees juggle work and family roles, they may experience tension, stress, and emotional fatigue (Ilies et al., 2015). This can be especially challenging if they face difficulties in either domain (Bachtiar & Yulianti, 2023).

These relationships is hypothesized thus;

H04: Work-Life Conflict does not mediate the relationship between work overload and employees’ mental health

H05: Work-Life Conflict does not mediate the relationship between work stress and employees’ mental health

H06: Work-Life Conflict does not mediate the relationship between employee burnout and employees’ mental health

2.1.6. Relationship between Work-Life Conflict (WLC) and Employees’ Mental Health (EMH)

Mental health refers to a person’s overall emotional and psychological state (Ling, 2023). Mental health, according to WHO (2022), is defined as a condition that enables people to handle life’s challenges, reach their potentials, and engage productively in society. Mental health disorders stem from feeling unable to handle life’s demands due to limited personal resources (Kamalulil et al., 2021). The personal resources in this context could be time, space, energy, material and financial resources. The triggers of mental health disorders are high work demands, improvement in technology, and domain integration (Singh, 2024). Meaningful employment fosters mental well-being, enhancing self-esteem and social interactions (WHO, 2024). Mental health disorders have the ability to reduce employees’ performances and increase absenteeism and stress levels at work (Randall, 2023).

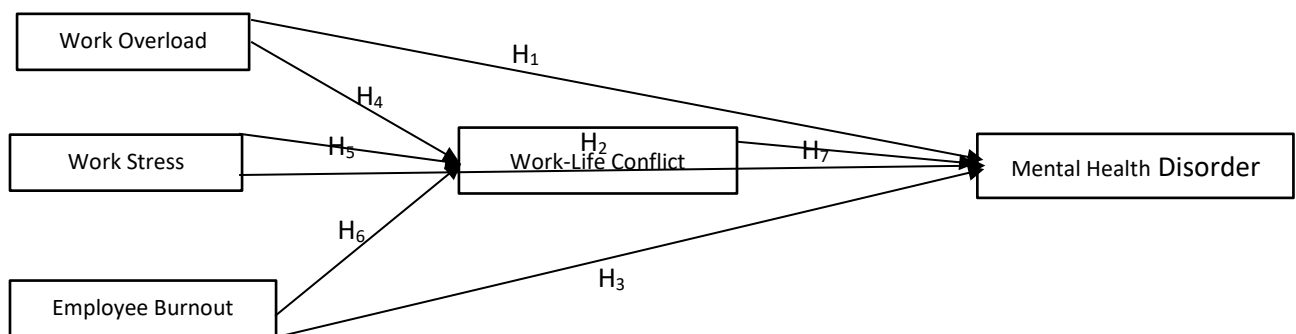
Taking up conflicting tasks leads to inter-role conflict, which results in psychological tension (Gisler et al., 2018). Zhou, Da, Guo, and Zhang (2018) found a negative correlation between work-family conflict and employees’ mental health, suggesting a positive relationship between work-family conflict and employees’ mental health disorder. According to Frone (2000), work-life conflict is linked to increased risk of mood disorders, anxiety, and substance dependency. Work-life conflict has a negative effect on employees’ effectiveness (Nwafili, 2024a), employees’ well-being (Siddiqui, 2013), and employees’ job satisfaction (Wen et al., 2024) and has exacerbated employees’ mental health challenges (Pitt et al., 2021).

H07: There is no positive significant impact of work-life conflict on employees’ mental health.

2.1.7. Conceptual Framework

The conceptual framework of variables attempts to show the link between the independent variables (work overload, work stress, and work burnout) and the dependent variable (employees’ mental health) with work-life conflict mediating, as shown in the figure below.

Figure 1: Conceptual Framework



2.1.8. Theoretical Underpinning—Resource Drain Theory

The resource drain theory suggests that using scarce resources (time, energy, attention, etc.) in one role domain (work) can deplete them for another role domain (family), causing tension and work-life imbalance (Nwafili et al., 2024). It refers to the transferability of resources from one domain to another (Edwards & Rothboard, 2000). Resource drain occurs when limited resources are diverted from one role domain to another, depleting what is available and potentially causing stress, fatigue, and burnout (Morris & Madsen, 2007). Work-life imbalance, otherwise known as work-family conflict, can be avoided through the adoption of boundary management strategies [behavioral or temporal strategies] (Nwafili, 2024b). This theory is suitable for this study because work overload, work stress, and work burnout deplete the family resources, causing work-family conflict or imbalance, which is capable of affecting employees' performance (Nwafili, 2024a), employees' job satisfaction (Nwafili et al., 2024), and employees' mental health (Pitt et al., 2021).

2.2. Empirical Review

Andriani and Disman's (2023) study examined the impact of job stress and overload on worker performance among 235 healthcare professionals. Using SPSS version 25 and PROCESS version 3.5 as statistical tools, the moderation categorical model was tested using path analysis based on ordinary least squares (OLS), regression, and the bootstrap method. The results showed that polychronicity and a conducive work environment effectively mitigated the effects of work overload, suggesting that staff quality enhancement and a positive work environment can reduce stress.

Andriani and Disman (2023) looked at how job stress and overload affected worker performance, as well as how polychronicity and the workplace environment affected these impacts. 235 healthcare professionals made up the study's sample size. The outcome demonstrated that the impact of work overload on employee performance through job stress was successfully mitigated by polychronicity and the work environment. Enhancing staff quality and creating a positive work environment are two ways to lessen work-related stress.

The study by Luo et al. (2021) examined the relationship between work stress and employees' physical and mental health using a grounded theory approach. A semi-structured interview with 15 state-owned company workers, coded in a three-level process using NVIVO 11, found that challenge/hindrance stressors significantly impact their physical and mental health, with self-efficacy and organizational support playing a moderating role. The research found that challenging stress led to positive attitudes and behaviors, while hindrance stress resulted in negative emotional experiences, affecting both physically and mentally.

According to a study by Gabriel and Aguinis (2022) on how to avoid and address employee burnout and establish healthier work environments both during and after crises, burnout was discovered to be a serious problem brought on by ongoing work-related stress that impairs performance, creativity, and innovation. During international catastrophes like the COVID-19 pandemic, it was very common. Organizations should offer stress management interventions, promote active work, foster social support, involve employees in decision-making, and apply excellent performance management to prevent burnout. In times of crisis and beyond, these suggestions support long-term workplace well-being.

Pitt et al. (2021) conducted a study on the mental health consequences of work-life and life-work conflicts among postdoctoral trainees in STEM. According to the study, postdocs were more likely to have work-to-life conflict than life-to-work conflict. When 215 trainees were surveyed, it was found that most postdocs had work-life conflicts, which were associated with poor mental health outcomes. The results may impact initiatives to increase participation and diversify STEM professions.

3. METHODOLOGY

This study used a survey research design and quantitative approach, allowing for data collection from a diverse population sample and statistical analysis (Udoh & Chinedum, 2014). The study was conducted in Lagos State, Nigeria, focusing on the corporate headquarters of selected consumer goods firms. The study is concerned with Nigeria's consumer goods sector, selecting 15 out of the 20 listed firms due to resource constraints. The survey targeted all staff levels, as they are impacted by the study's variables. The table below shows the details of the selected firms for this study.

Table 1: List of Selected Consumer Goods Firms

S/N	Company	Date Incorporated
1.	BUA FOODS PLC	April 13, 2005
2.	CADBURY NIGERIA PLC.	January 9, 1965
3.	DANGOTE SUGAR REFINERY PLC [CG+]	January 4, 2005
4.	DN TYRE & RUBBER PLC [DIP]	October 21, 1961
5.	GUINNESS NIG PLC [CG+]	April 29, 1950
6.	HONEYWELL FLOUR MILL PLC [BLS][CG+]	July 9, 1985

7.	INTERNATIONAL BREWERIES PLC. [BLS]	December 22, 1971
8.	NASCON ALLIED INDUSTRIES PLC	April 30, 1973
9.	NESTLE NIGERIA PLC. [CG+]	September 25, 1969
10.	NIGERIAN BREW. PLC. [CG+]	November 16, 1946
11.	NIGERIAN ENAMELWARE PLC.	May 21, 1960
12.	P Z CUSSONS NIGERIA PLC. [CG+]	April 12, 1948
13.	UNILEVER NIGERIA PLC. [CG+]	November 4, 1923
14.	UNION DICON SALT PLC. [DWL]	November 12, 1991
15.	VITAFOAM NIG PLC.	April 8, 1962

Source: Adapted from the Nigerian Exchange.

A sample of 375 employees was selected from the 15 firms, with a convenient and manageable size of 25 staff members chosen from each company (Bryman, 2016). Given the diverse nature of the sample, a stratified random sampling technique was used to ensure representation from all selected firms.

A structured questionnaire was used to collect data from 375 staff and management of the listed consumer goods companies in Lagos State, Nigeria. The questionnaire, divided into three sections, employed a 5-point Likert scale (from strongly agree to strongly disagree). While Section A captured respondents’ biographic information, Section B and Section C captured independent variables (work overload, work stress, and burnout) and the dependent variable (employees’ mental health), respectively.

Content validity was used to ensure the instrument accurately measured its intended constructs (Olannye, 2017). Reliability was assessed through a pilot study using Cronbach’s Alpha, with values of 0.7746 and above considered acceptable (Sekaran, 2003). Data analysis was carried out using PLS-SEM.

Model Specification (PLS-SEM Framework)

This study adopts a variance-based Structural Equation Modeling (PLS-SEM) approach. The constructs in the model are represented as;

Exogenous (Independent Variables) - Work Overload (WO); Work Stress (WS); Employee Burnout (EB)

Endogenous (Dependent Variable) - Employees’ Mental Health (EMH)

Mediating Variable - Work-Life Conflict (WLC)

Table 2: Construct Operationalization Table

Construct	Code	No. of Items	Measurement Type	Source Adaptation
Work Overload	WO	5	Reflective	Adapted from role overload scales
Work Stress	WS	5	Reflective	Job stress scales
Employee Burnout	EB	5	Reflective	Burnout literature (e.g., emotional exhaustion)
Work-Life Conflict	WLC	5	Reflective	Work-family conflict scales
Employees’ Mental Health	EMH	5	Reflective	Psychological well-being scales

Structural Model Equation

$$EMH = \beta_1 WO + \beta_2 WS + \beta_3 EB + \beta_4 WLC + \mu$$

$$WLC = \beta_5 WO + \beta_6 WS + \beta_7 EB + \mu$$

$$WLC = EMH$$

4. RESULT AND ANALYSIS

Questionnaire totalling 375 was administered on employees of affected firms, out of which 301 was returned, which represents 80.3%, and considered effective for the data analysis.

Table 2: Socio-Economic Attributes of Participating Employees

Participants’ Bio-Data	Responses	Rate (%)
Gender		
Male	185	61.5
Female	116	38.5
Total	301	100

Age		
25 Years Old and Below	38	12.6
26 – 35 years Old	60	20.0
36 -45 Years Old	92	30.6
46- 55 years Old	85	28.2
56 years Old and Above	26	8.6
Total	301	100
Marital Status		
Single	97	32.2
Married	187	62.1
Divorced/Widowed	17	5.7
Total	301	100
No of Children		
None	23	7.6
1	65	21.6
2	86	28.6
3	72	23.9
4	30	10.0
5 and Above	25	8.3
Total	301	100
Qualifications		
O’Level	28	9.3
ND/Equivalent	65	21.6
B.Sc./Equivalent	197	65.4
Post Graduate	11	3.7
Total	301	100
Years of Work Experience		
Less than 10 Years	65	21.6
10 – 15 Years	107	35.5
16 – 20 Years	95	31.6
Above 20 Years	34	11.3
Total	301	100
Employment Status		
Full Time	263	87.4
Casual	38	12.6
Total	301	100
Position		
Rank and File	65	21.6
Supervisory	185	61.5
Managerial	51	16.9
Total	301	100

Source: Field Survey, 2025

The above table shows gender to comprise of male numbering 185 (61.5%) and female, 116, (38.5%), implying a male dominated industry probably due to the indicators or constructs of this study; the age bracket include, 25 years old and below, 38 (12.6%), 26-35 Years old, 60(20%), 36-45 Years old, 92(30.6%), 46-55 Years old, 85 (28.2%), and 56 Years old and above, 26 (8.6%), meaning the industry is dominated by young population. The marital status of the respondents as represented in table 2 unveiled single and unmarried to be 97(32.2%), married, 187 (62.1%), and divorced/widowed, 17 (5.7%). Workers with families are mostly affected by work-life conflict and mental health issue as they care about their family unlike the singles. Hence, about 67.8% of the respondents are more adversely affected by the constructs in the model.Regarding the number of children, 23 (7.6%) are yet to have children, 65 (21.6%) had 1 child, 86 (28.6%) had 2 children each, 72 (23.9%) had 3 children, 30(10%) had 4 children (8.3%) and 25 (8.3%) had 5 and above children. The more the number of children, the more the family responsibility and the more the individuals will be influenced by the constructs.Furthermore, the education qualifications of the respondents showed workers with O’level to 28 (9.3%), ND and equivalent are 65 (21.6%), B.Sc and equivalent, 197 (65.4%), post graduates, 11 (3.7%).The implication is that 91.7% of the respondents are competent to provide answers to questionnaire questions. On years of experience, workers with less than 10 years experience are 65 (21.6%), 10-15 years, 107 (35.5%), 16-20 years , 95(31.6%) and above 20 years are 34 (11.3). It is expected that the experienced will be less affected by the model’s constructs, having put in years in the performance of similar duties. Majority of the respondents are full time workers, 263 (87.4%), while the casuals are 38 (12.6%). The full times knows more about the

organization and can competently respond to the research questions. Again, concerning the positions in the organization, the rank and files are 65 (21.6%), those on supervisory positions are 185 (61.5%) and those on managerial positions are 51(16.9).

5. DISCUSSION AND FINDINGS

Five hypothetical constructs were examined in the structural equation model shown in figure 1 above – work overload, work stress, employee burnout, work-life conflict and mental health disorder. This model has strong empirical support and data driven, providing understanding of the interconnectivity and evaluation measurement of the variables.

Mental health disorder which is central to the model is directly affected by work overload, and employees' burnout, and indirectly affected by work overload, and work stress with work-life conflict intervening. In this model, employees' burnout has direct effect on mental health disorder with a coefficient of 0.303, implying that mental health disorder can be caused by burnout. Employees' that are having much burnout are susceptible to mental illness. Conversely, work-life conflict is not impacted by employees' burnout as revealed by the recorded 0.006 coefficient in the model. This suggests that in the observed data, burnout is not closely tied to the perception of imbalance between professional and personal life but rather stems from other stress-inducing sources intrinsic to the work environment.

Work overload shows a dual influence. It directly predicts mental health disorder with a path coefficient of 0.143, while also influencing work-life conflict with a stronger coefficient of 0.295. The impact of work-life conflict on mental health disorder is significant with a coefficient of 0.554, thereby creating an indirect relationship of 0.163 on work overload, work-life conflict and mental health disorder, resulting to a coefficient of 0.306 work overload effect on mental health disorder. The implication of this model is that the trauma involved in maintaining equilibrium between work and non-work roles outweighs that of the impact of work overload on emotional exhaustion.

Work stress follows a distinct path, having no direct impact on mental health disorders but exhibiting a pronounced indirect effect through work-life conflict. With a coefficient of 0.699 linking work stress to work-life conflict and 0.554 from work-life conflict to mental health disorder, the resulting indirect effect is 0.387. This constitutes the highest total effect on mental health disorder among all exogenous variables in the model. The implication is that work-related stress triggers a perception of conflict between personal and work domains, and this conflict, rather than stress alone, becomes the channel through which mental health deteriorates. The implication of this model is that the trauma involved in maintaining equilibrium between work and non-work roles outweighs that of the impact of work overload on emotional exhaustion.

The direct relationship in this model aligns with the proposition that mismanaged stress, when encroaches into personal life domain causes psychological trauma and escalated mental health issues. All the variables in the model have different indicators with high outer loading, implying a very strong measurement. For employee burnout, indicators X11 through X15 all have loadings above 0.973, with X11 and X12 each loading at 0.991 and 0.987, respectively. These items are clearly capturing core symptoms or expressions of burnout, with minimal error or redundancy. The indicators weight indicated an even contribution between 0.197 to 0.205 and preventing the domineering of any item.

Work overload evaluated using five indicators (X1-X5), each with outer loading exceeding 0.979, led by X1 which is 0.992. This means that workload factors are very strong, impacting greatly on the model. This results from the nature of job performed, the different roles performed as well as the urgency and complex nature of jobs. The even distribution shows a balanced scale.

Work stress was measured using the indicators; X6 to X10 with their contributions ranging between 0.979 and 0.994. The underlying stress was revealed in this model through a well-defined construct. This high loading suggests that the major stressors like time pressure or emotional strain was thoroughly captured.

Employees burnout was reliably captured through the indicators X11 to X15. The outer loading indicated a contribution ranging between 0.991-0.987, with 0.991 topping the weight load and causing much burnout on employees. Variables of burnout were adequately captured in the model, accounting for the high loading of the constructs.

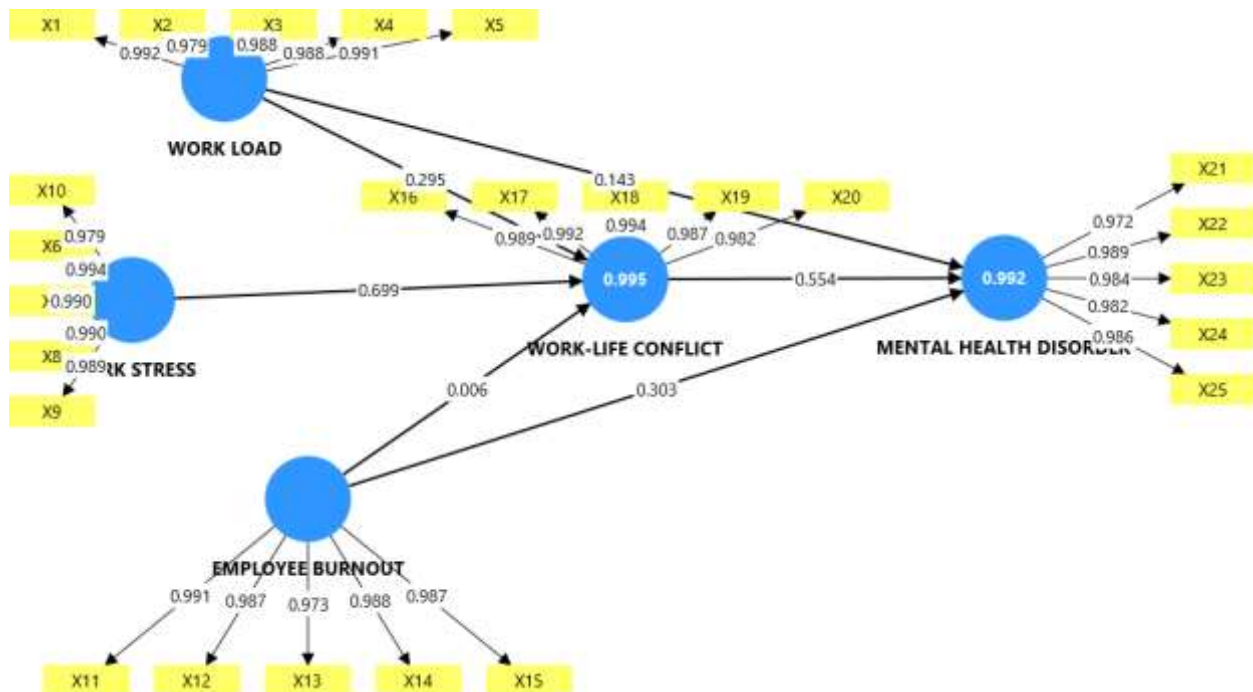
Indicators, X16- X20 assessed work-life conflict with loadings exceeding 0.982. The construct, X18 tops with 0.994 due to incongruence between work demand and family demand, a situation whereby work roles spills into family roles thereby depleting the family resources.

Mental health, being the endogenous variable was captured in the model using the indicators, X21- X25, meaning five items were considered with each loading more than 0.972, an indication that mental health disorder factors, such as anxiety, depression, strain, emotional exhaustion, and frequent unaccomplished tasks (Low performance). The loading of X22 being depression tops the chart with 0.989 and weight of 0.204, implying a serious implicit mental health disorder symptom.

The relationship existing among the constructs are very high, ranging between 0.979-0.997, suggesting a possible conceptual overlap especially work stress and work-life conflict: 0.997.

Descriptive stats show standardized latent variables with mild negative skew and platy kurtosis. Non-normal distributions are confirmed (Cramér-von Mises $p < 0.001$), making PLS-SEM a good fit.

Figure 2: Partial Least Square Structural Equation Model



6. CONCLUSION

Based on the findings from the structural equation model, it can be concluded that work overload and burnout directly impact employees’ mental health. On the other hand, work stress does not have a direct impact on employees’ mental health but influences work-life balance, which in turn impacts employees’ mental health. Work-life conflict mediated the relationship between work overload, work stress, and employees’ mental health but does not mediate between burnout and employees’ mental health. Employees’ burnout wasn’t as a result of imbalance between work and family responsibilities but resulted from work-related strains. In as much as the employees are expected to perform optimally, realistic targets should be given to them to reduce work overload, stress, and burnout, which often result in work-life imbalance and employees’ mental health disorders.

7. RECOMMENDATIONS

Based on the findings of this study, the following are recommended;

1. Appropriate remuneration of the employees to cushion the impact of work overload, stress and burnout within the organization.
2. Occupational health and safety policy framework should be strengthened to reduce psychological distress associated with work overload, stress, and burnout so as to improve productivity.
3. Encouraging flex hours, time management, weekend off, annual leave and remote working (tele-working) to reduce work-life conflict and to enhance work-life balance.

8. LIMITATION OF THE STUDY

The limitation includes focusing on consumer goods industry instead of the entire manufacturing industry. Further research should expand the scope to make it broader.

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APPENDIX 1: SURVEY QUESTIONNAIRE

Title: Assessing The Impact of Work Overload, Work Stress and Employees’ Burnout On Employees’ Mental Health: Work-Life Conflict Mediating

Instructions: Please read the questions below and respond appropriately. All responses shall be treated with utmost confidentiality since it is purely for academic purposes.

PART I: DEMOGRAPHIC INFORMATION

Please check the box that corresponds to your personal information.

Variable	Category	Check
Gender	Male	<input type="checkbox"/>
	Female	<input type="checkbox"/>
Age	25 years old and below	<input type="checkbox"/>
	26 – 35 years old	<input type="checkbox"/>
	36 – 45 years old	<input type="checkbox"/>
	46 – 55 years old	<input type="checkbox"/>
	56 years old and above	<input type="checkbox"/>
Marital Status	Single	<input type="checkbox"/>
	Married	<input type="checkbox"/>
	Divorced/Widowed	<input type="checkbox"/>
No of Children	Nil	<input type="checkbox"/>
	1	<input type="checkbox"/>
	2	<input type="checkbox"/>
	3	<input type="checkbox"/>
	4	<input type="checkbox"/>
	5 and Above	<input type="checkbox"/>
Educational Qualifications	ND/NCE	<input type="checkbox"/>
	HND/B.Sc.	<input type="checkbox"/>
	Post Graduate	<input type="checkbox"/>
Years of Work Experience	Less than 10 Years	<input type="checkbox"/>

	10- 15 Years	[]
	16-20 Years	[]
	Above 20 years	[]
Employment Status	Full Time	[]
	Casual	[]
Position	Rank and File	[]
	Supervisory	[]
	Managerial	[]

PART II: ASSESSMENT OF VARIABLES

Scale	Verbal Interpretation	Description
5	Strongly Agree (SA)	The statement is always true/observable.
4	Agree (A)	The statement is often true/observable.
3	Neutral (N)	The statement is neither true nor false/observable.
2	Disagree (D)	The statement is often false/unobservable.
1	Strongly Disagree (SD)	The statement is always false/unobservable.

A. WORK OVERLOAD (WO)

S/N	Items	5	4	3	2	1
1.	I am required to work very fast to complete my tasks	[]	[]	[]	[]	[]
2.	I have too many responsibilities at work	[]	[]	[]	[]	[]
3.	I often have insufficient time to complete my work	[]	[]	[]	[]	[]
4.	My workload is excessive	[]	[]	[]	[]	[]
5.	I am frequently required to work beyond normal hours	[]	[]	[]	[]	[]

B. WORK STRESS (WS)

S/N	Items	5	4	3	2	1
5.	I feel stressed because of my job demands	[]	[]	[]	[]	[]
6.	My job makes me feel emotionally drained	[]	[]	[]	[]	[]
7.	I feel pressure to meet unrealistic deadlines	[]	[]	[]	[]	[]
8.	I find it difficult to relax after work	[]	[]	[]	[]	[]
9.	My job causes me anxiety	[]	[]	[]	[]	[]
10.	I find it difficult to relax after work					

C. EMPLOYEES' BURNOUT (EB)

S/N	Items	5	4	3	2	1
11.	I feel exhausted at the end of the workday	[]	[]	[]	[]	[]
12.	I feel emotionally drained from my work	[]	[]	[]	[]	[]
13.	I feel less motivated to go to work	[]	[]	[]	[]	[]
14.	I feel detached from my job	[]	[]	[]	[]	[]
15.	I feel frustrated by my work	[]	[]	[]	[]	[]

D. WORK-LIFE CONFLICT (MEDIATOR) (WLC)

S/N	Items	5	4	3	2	1
16	My work interferes with my personal life	[]	[]	[]	[]	[]
17.	I have little time for family due to work demands	[]	[]	[]	[]	[]
18.	My job makes it difficult to fulfill personal responsibilities	[]	[]	[]	[]	[]
19.	I often think about work even during personal time	[]	[]	[]	[]	[]
20.	My work negatively affects my social life	[]	[]	[]	[]	[]

E. EMPLOYEES' MENTAL HEALTH (EMH)

S/N	Items	5	4	3	2	1
21.	I feel mentally exhausted due to my work	[]	[]	[]	[]	[]
22.	I experience frequent mood swings because of work	[]	[]	[]	[]	[]
23.	I feel anxious or depressed due to work-related issues	[]	[]	[]	[]	[]
24.	I find it difficult to concentrate because of work stress	[]	[]	[]	[]	[]
25.	My mental health has declined due to my job	[]	[]	[]	[]	[]