



TRANSFORM TO SUSTAIN: THE ROLE OF DIGITAL TRANSFORMATIONAL LEADERSHIP IN SHAPING SUSTAINABLE PERFORMANCE OF ORGANIZATION

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Abstract

In an era where sustainability and digitalization are reshaping global industries, leadership emerges as the critical force bridging technological innovation and environmental responsibility. This study explores how Digital Transformational Leadership (DTL) influences Sustainable Performance (SP) through the mediating role of Digital Transformation (DT) within the textile sector of Punjab, Pakistan—an industry facing intense institutional, regulatory, and global market pressures. Drawing on New Institutional Theory (NIT), the research conceptualizes DTL as an institutional translator that guides firms in adapting to coercive, normative, and mimetic forces through digital means. Data were gathered from CEOs and senior management executives who possess strategic insight into organizational transformation processes. Using SPSS for preliminary analyses and AMOS for structural equation modeling, the study validates a framework in which DTL acts as a catalyst for digital adaptation, enabling firms to achieve sustainable outcomes. The findings advance institutional theory by positioning digital transformation as a strategic adaptation mechanism rather than a purely technological shift. This research contributes theoretically by linking leadership-driven digital initiatives to institutional adaptation and sustainability, and practically by emphasizing the need for leadership competencies that integrate digital innovation with environmental and social responsibility in emerging economies.

Keywords: *Digital Transformational Leadership (DTL), Digital Transformation (DT), Sustainable Performance (SP), New Institutional Theory (NIT), Textile Sector, Punjab, Pakistan, SPSS, AMOS.*

1. Introduction

Swift technological advancement in exploitation of natural and environmental resources that marks the Industrial Revolution has led the creation of modernized human society. As the ever-higher demand requires an unparalleled rapid extension of production capacity, the rising incongruity among demand, availability of resources and the environmental protection have become even sterner (Ghobakhloo, 2020). Nevertheless, today's society is still focusing on continuous development and this is not only the growth of economic indicators rather it takes into account the sustainable development that helps in balancing economic, social and environmental aspects (Ford, 2016). Sustainability is defined by the United Nations as the endeavor to make sure an improved and enhanced sustainable welfare for all, covering future generations. The idea behind this movement is to address the continuous global inequalities, world peace, pollution, rapid changes in climate, environmental deterioration and other lasting issues (Nascimento et al., 2019).

Certainly, it is the responsibility of every organization to put forth additional efforts in balancing their social, environmental and economic performance (Ayuso et al., 2012).

As the term “Industry 4.0” attained the extensive recognition, the digital transformation that is happened due to Industry 4.0 has instantly gained the attention of wide-reaching governments and global industries (Ghobakhloo, 2020). In the time that is marked by technological advancements, changing market dynamics, and rising environmental concerns, organizations face unique and unparalleled challenges to stay competitive, sustainable and agile. Textile industry of Pakistan, that contributes more than 60% of total exports of the country and about 40% of industrial labor force, is also witnessing these challenges (Pakistan Bureau of Statistics, 2023). The textile industry of Pakistan is facing ever rising pressure from global supply chain to leave obsolete practices, instead innovate and transform business models to comply not only the quality and cost standards but also be vigilant about social and environmental benchmarks. The rising need to pay attention to sustainability along with digital transformation is quite critical for organizations. Firms cannot survive just by focusing on been cost efficient alone, rather, long standing success depends on attaining sustainable performance through visionary leadership, digital transformation, strategic adaptation and building capabilities that can take care of constant change.

The success of the digital transformation depends less on the technology and more on the leadership that marshals, envisions and embeds novel digital styles of working. Digital leaders assess market portfolio on behalf of the firms and help them to bring necessary business innovation and achieve sustainable performance (Benitez et al., 2022). Digital transformational leadership works ahead of conventional leadership by laying emphasis on collaborative culture, agility, persistent learning and strategic exploitation of digital tools resulting in enhancement of competitiveness, value creation and sustainable performance. However, digital transformational leadership does not work alone. Its impact on sustainable performance is frequently reliant on ability of the organization to embrace meaningful and successful digital transformation (Chen & Shahid 2024).

Today’s era is marked by rapid development of digital technologies. Digital technologies have wide range affects in each industry (Ciarli et al., 2021; Bernardo et al., 2023; Sharma et al., 2023). So, they lay pressure on organizations to take initiatives related to digital transformation (Verhoef et al., 2021; Hanelt et al., 2021; Hu et al., 2023). For organizations to develop, survive and be sustainable, it has become the necessity rather than a choice to transform digitally (Porfirio et al., 2021). Digital transformation is referred as the incorporation of digital technologies that ensure redesigned processes, procedures and roles. Rising evidence that links digital transformation with sustainable performance and green innovation, digital transformation helps in improving process efficiency, fosters real-time controls, reduce wastage, and support transparent supply chain management engagement (Asbeetah et al., 2025; Chen et al., 2024).

Digital transformational leadership directly impact sustainable performance but this relationship is augmented by the inculcation of digital transformation. Digital transformational leaders (a) articulate digital vision linked to sustainability (b) prefer investments in automation undertaking social and environmental impacts (c) redesign routines and incentives so that digital tools are practically used.

This study highlights the importance of visionary leadership in fostering organizational change. According to Bass and Avolio (1994), digital transformational leaders rooted to

transformational leaders, motivates their teams to opt new ways of thinking, adopt innovative practices and break the status quo. This style of leadership is vital to drive digital transformation, as it aligns goals of individual team with bigger organizational objectives, along with ensuring sustainability linked to the changes made. According to transformational leadership theory leaders who offer individualized support, instigate a shared vision, and foster intellectual stimulation are prone to foster environments that adapt as well as thrive through digital transformation.

The aim of the study is to explore the relationship between digital transformational leadership and sustainable performance in the textile sector of Punjab, Pakistan. In relationship between digital transformational leadership and sustainable performance, digital transformation is serving as the mediator that augment the relationship between IV and DV. This relationship is examined through the lens of New Institutional Theory (NIT) theory. This study offers both practical and theoretical insights into how industries can progress towards sustainability through digital transformational leadership and digital transformation.

Based on above discussion, this research focuses on the following research questions:

RQ1: Does digital transformational leadership directly impact the sustainable performance (economic, social, and environmental)?

RQ2: Does digital transformation mediate the relationship between digital transformational leadership and sustainable performance?

There are many studies on sustainable performance such as sustainable leadership and sustainable performance (Iqbal et al., 2020); transformational leadership and sustainable performance (Gun et al., 2024), digital transformation and sustainable performance (Li, 2022; Mohaghegh et.al., 2025). But the extensive review of literature discloses there is insufficient work on sustainable performance linked to the digital transformational leadership also taking digital transformation as a mediator. So, this study aims to fill this void in the literature under the lens of new institutional theory. This study has practical contribution for leaders of the textile industry of Punjab and give a sequenced roadmap—how to lead (behaviors related to digital transformational leadership), where to invest (digital transformation e.g. digital quality control measures, metering etc.) and how to measure (KPIs linked to Tripple Bottom Line, global compliance standards etc.). Findings of the study will guide provincial and federal government for initiatives like discounted finance for clean and green projects, energy audits, green infrastructure and others. Textile sector of Pakistan which is already facing strict buyer scrutiny tests, energy volatility, better cotton initiatives, this study will provide insights regarding how leadership renders digital spending into quantifiable and verifiable gains related to triple bottom line are both timely and actionable.

2.Literature Review and Hypothesis Development

2.1 Underpinning Theory

The theoretical framework of this study is based on new institutional theory (NIT). NIT has backed extensive literature related to digital transformation to explore its various aspects (Verhoef et al., 2021; Shashi et al., 2020; Dubey et al., 2018b). Nevertheless, there is insufficient research regarding the use of this particular theory to investigate and external internal facets associated with the implementation of digital transformation such as leadership and sustainable performance of the organization, which are covered in this segment.

In modern organizational research INT is a protruding perspective. It incorporates huge amount of empirical and theoretical work highlighting the value of shared expectations and cultural

understandings (David & Bitektine, 2009). Likewise, NIT enlightens the ways organizations used to engage with their environments to survive and thrive to cope challenges and competition. Organizations/institutions are observed as having common understandings and shared understandings of acceptable norms that collective in their nature such as practices, job titles and policies (Meyer & Rowan, 1977; Parsons, 1956). NIT pinpoints three essential forces that form organizations. Coercive pressure is the first one, which often originate from agencies sponsored by government, the rising demands of the resource-controlling or powerful organizations. Imitative pressure is the second, it results from the decision-maker looking to the behavior of other organizations to direct their organizations. The third and last is normative pressure which covers social expectations arisen through the adoption of specific practices and policies by professionals and some other actors (Meyer & Rowan, 1977). According to the work of (Dubey et al., 2019; Adebajo et al., 2018) NIT has mainly been used to investigate external pressures or factors that affect organization's culture and practices that cause change in the organization by applying advanced technology. Within NIT innovation and change have been described by highlighting the sociocultural facets of organizing using two means: (1) as the relationship between change and stasis, considering homogeneity and continuity along with heterogeneity and change among organizations (Greenwood et al., 2017); and (2) seeing change and stasis as the result of planning, activities, structures and actions at various stages of analysis that include individual, field, societal and organizational levels. This study elected to opt these two NIT approaches to investigate sustainable performance and digital transformation as a multifaceted and radical change in organization emphasizing leadership.

NIT provides a framework to understand organization's response to external institutional environments like industry norms, societal expectations and regulatory pressures (DiMaggio & Powell, 1983). Contrasting to the traditional economic theories which mainly focus on profit maximization and improving efficiency, NIT enlightens the role of social legitimacy and conformity in determining organizational behavior. With regards to digital transformation, organizations are motivated by internal strategic objectives along with external expectations particularly in industries directed by public scrutiny or regulation. Such as, in the textile industry, organizations are projected to opt sustainable practices and conform to international environmental standards, that surges pressure to incorporate digital technologies supporting sustainability goals.

NIT proposes that organizations incline to implement alike practices due to institutional isomorphism- it is a process through which organizations under the similar field become alike overtime, due to normative, mimetic and coercive pressures (DiMaggio & Powell, 1983). In textile sector, organizations adopt sustainability initiatives and digital transformation activities not only to improve efficiency but to attain legitimacy from stakeholders such as investors, regulators and consumers.

2.2. Digital Transformational Leadership and Digital Transformation

Digital transformation is marked by planned changes brought about by advanced technologies (Bresciani et al., 2021b). Digital transformation can be defined as an organizational change to analytics, big data, mobile communication technologies, the cloud and social media places to offer good and services (Bresciani et al., 2021b; Nwankpa & Roumani, 2016). Nasiri et

al. (2020) defined digital transformation as an instrument for changing business processes, organizational aspects and cultures to encounter evolving market requirements happened due to digital technologies. Digital transformation is marked by three elements: (1) redefining and reconsidering firm boundaries; (2) bringing up products and services to incorporate community input, along with minimizing property rights; (3) redesigning product and organizational identities (Parmentier & Mangematin, 2014). NIT takes digital transformation as an essential institutional change that disseminates through and interrupts both organizations and fields (Del Giudice et al., 2021; Hinings et al., 2018).

From NIT standpoint, leadership is viewed as an essential component of organizational belief systems and values; gradually when organizations change, leadership must likewise adapt and change (Biggart & Hamilton, 1987). Organization went through the digital transformation by changing the operation and delivery of their products or services by endorsing digital cultures (Bresciani et al., 2021; Chierici et al., 2021). It will not work without leaders who help in creating such platforms and motivate stakeholders for action (Sainger, 2018). Leader's role in propelling and assuring the shift to industry 4.0 is crucial and emphasized in the literature (Porfirio et al., 2021; Li et al., 2016). In digital age, leaders can assist organizations to prosper following three habits: (1) go along with the trends of emerging technologies; (2) finding out the trend of investment strategy and digital change; and (3) guiding the team to change precisely and quickly (Swift & Lange, 2018). Digital leaders who have digital transformation mindsets, can discover digital competencies and construct collaborative network organizations (Bresciani et al., 2021; Frankowska). In digital transformation literature, transformational leadership (TFL) has been given specific importance, which investigates leadership in a digital environment. Transformational leaders urge to develop leadership in others, develop trust, manifest self-sacrifice, and act as moral agents, concentrating on both their followers and themselves to meet and exceed group objectives (Avolio, 1999). Hence, digital transformational leadership is taken as a combination of digital technology and transformational leadership (De Waal et al., 2016). The present literature shows transformational leadership helps thriving organization's innovation capability, that is the important pillar of digital transformation (AlNuaimi et al., 2021b; Lei et al., 2020; Sasmoko et al., 2019). Ardi et al. (2020) too explored digital leadership from the perspective of transformational leadership, and found that digital transformational leadership has a positive influence on organizational performance and innovativeness. Supporting by the above discussion, following hypothesis is proposed:

H1: Digital transformational leadership positively influences digital transformation.

2.3. Digital Transformational Leadership and Sustainable Performance

The studies and significance related to sustainable performance has increased over the time. Sustainable performance assures that organizations comprehensively balance their social, economic and environmental performance goals (Afum et al., 2020). Hence, measuring performance from sustainable perspective assists firms to evaluate and attain improvement about environmental and social developments at all stages in their supply chain whereas at the same time creating and enhancing value for its stakeholders (Çankaya & Sezen, 2019). Economic performance (EP) is frequently measured from both financial and operational outcomes. From operational viewpoint, EP is linked with the ability of firms to reduce inputs cost, waste management, consumption of energy and fines for environmental hazards (Abdul-Rashid et al.,

2017). In this study EP is measured from finance-based pointers such as return on asset, return on investment, sales growth, profit and return on equity. Many scholars (Rao & Holt, 2005; Tudose et al., 2022) have measured EP from this viewpoint. Environmental performance is attained when firms in manufacturing industry lessen water and solid waste, minimize carbon emissions, reduce environmental impacts, lessen the occurrence of environmental accidents and reduce the usage of harmful and contaminated inputs (Çankaya & Sezen, 2019; Centobelli et al., 2019). Since the awareness regarding the corporate social responsibility is increasing among firms, social performance (SP) has become important and relevant in gauging supply chain. SP is assessed by community's better quality of life, health and safety of employees, employees training, and vocation training designed for community members (Abdul-Rashid et al., 2017; Wang & Dai, 2018).

The 21st century has been marked as an era of rapid technological advancements that reshaped industries across the globe. In this context, leadership has arisen as a crucial factor in directing organizations to achieve sustainable performance through the means of digital transformation. Digital transformational leadership (DTL) bring about technology driven change. DTL is not only important for executing digital transformation but it also aligns sustainable performance goals, including social responsibility, economic feasibility and environmental protection (Bass & Riggio, 2006; Avolio & Yammarino, 2013). DTL manifest the attributes of transformational leaders focusing them to guiding and managing digital change.

The study of (Asbeetah et al., 2025) indicates that DTL reinforced the relationship between sustainable corporate performance, digital transformation, green knowledge acquisition and innovation performance. Their findings show that leadership build an environment that connects digital tools with innovation and organizational learning that are predictors and supporters of sustainable outcomes. In textile sector DTL has significantly contributed to environmental sustainability. In textile industry, transformational leadership helps in acquiring green human resource management practices that ultimately enhance environmental performance (Gull et al., 2022). From the above discussion, following hypothesis is proposed:

H2: Digital transformational leadership positively influences sustainable performance.

2.4. Digital Transformation and Sustainable Performance

Industry 4.0 technology is broadly recognized as crucial factor to not only to achieve sustainable business objectives but also augment the overall performance of the organization Jayashree et al., 2021. DT rationalize decision making in planning and production, minimize lead times and eventually enhance business profitability and efficacy (Zhang & Dong 2023). Looking from the ecological viewpoint, DT permits the monitoring and examination of eco-efficiency, carbon dioxide (CO₂) discharge and environmental impacts of production processes (Li et al., 2020). Furthermore, it contributes to lessening waste generation, minimize energy consumption, promoting energy conservation and reassuring practices like resource recycling and reuse to optimize efficiency of resources and overall enhancement of environmental performance of the organization (Kumar et al., 2021). This enhanced environmental performance brings about numerous multiple advantages for the organization such as enhanced employee contentment, improved stakeholder rapport, better employee retention, and enhanced brand image (Khurshid & Darzi 2016). Likewise, there are added benefits like improved awareness of social responsibility among employees, talent acquisition and retention (Mehta & Chugan 2015). Wagner (2013)



demonstrated that investment in social responsibility results in tangible benefits in the shape of employee and customer satisfaction, attracting the best resource from the market and innovation performance, all of these lead to enhanced sustainable performance of the organization. Based on the above discussion, following hypothesis is proposed:

H3: Digital transformation positively influences the sustainable performance.

2.5. Mediating Role of Digital Transformation

Numerous empirical studies confirm the mediating role of digital transformation between leadership and sustainable performance. Digital transformation significantly contributes corporate sustainable performance through knowledge acquisition and innovation but the relationship is even strengthened in the presence of digital transformational leadership (Asbeeta et al., 2025). Likewise, the work of Cuevas-Vargas et al., (2022) demonstrated transformational leaders promote the culture of learning and innovation that convert digital initiatives into sustainability outcomes and enhanced corporate social responsibility. Kwilinski et al., (2023) highlighted that digital transformation not only strengthen ESG reporting but also helps firms to meet regulatory requirements and explore new avenues that are profitable and linked to sustainable outcomes. Verhoef et al. (2021) demonstrated that in the absence of appropriate digital transformation, digital leadership might not be able to contribute towards tangible performance outcomes. Furthermore, digital transformation helps organization to integrate their operations with sustainability frameworks, enabling leaders' strategic vision actionable and quantifiable (Troise et al., 2022). Based on these, fourth hypothesis of the study is as follows:

H4: Digital transformation mediates the relationship between digital transformational leadership and sustainable performance.

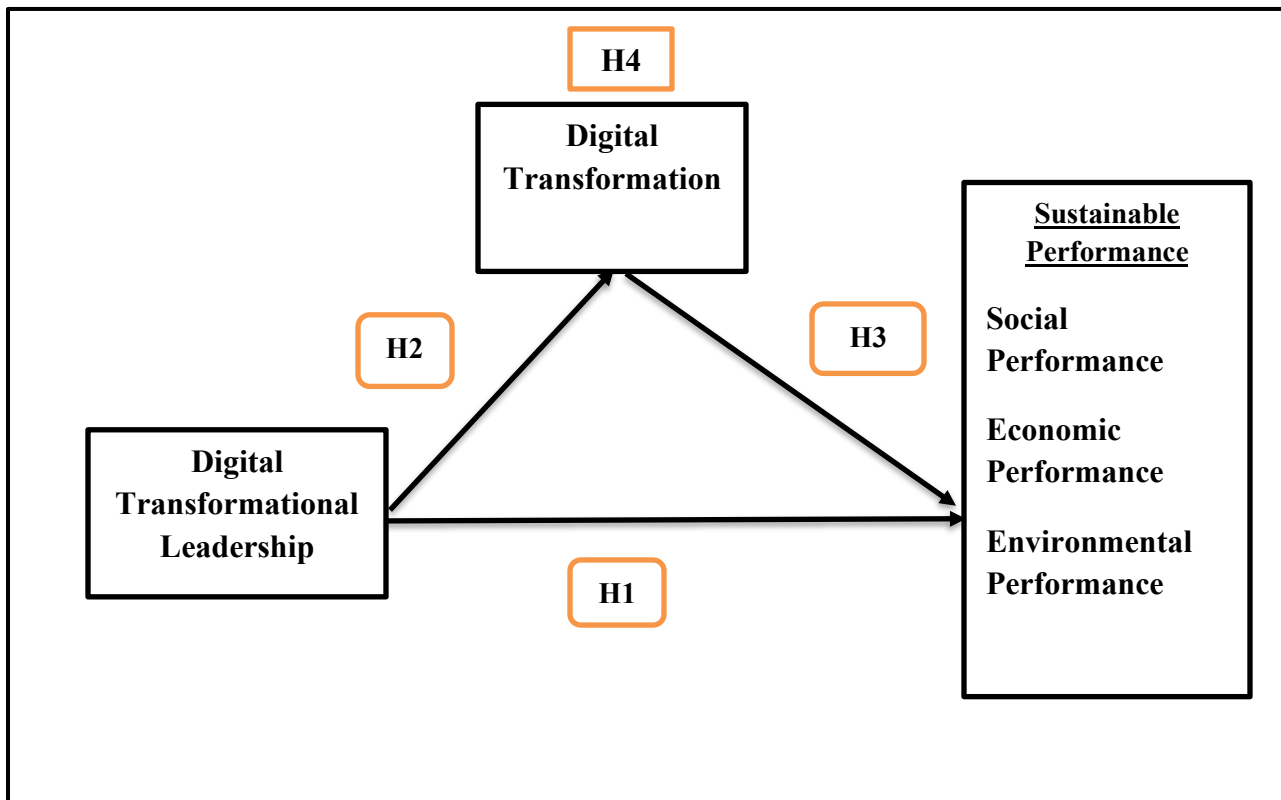


Figure 1: Research Model

3. Methodology

3.1. Research Design, Data Collection and Sample

This research study applied a quantitative approach, utilizing a cross-sectional design and following a deductive research strategy to explore the relationships among variables of the study i.e. digital transformational leadership, digital transformation and sustainable performance. To supplement the literature in the field of business management, this research used the primary data and conduct survey via questionnaires.

The population of the present study is textile firms of Pakistan with a specific focus on Punjab because of its strategic importance and significant relevance. Textile sector of Pakistan is the backbone of country's economy. According to the Pakistan Bureau of Statistics (2023) textile sector contributes 8.5% to the GDP, 40% of industrial employment and 60% of total exports of

Pakistan. It is the largest manufacturing and labor-intensive industry. Additionally, this research targets the textile companies of Punjab. Punjab holds significance position, as 355 out of the total 517 textile companies are operating in the province that accounts 69% of the national total. This makes Punjab the most segmented region in the textile sector. To ensure the representativeness of sample and minimize the risk of selection bias this study employed simple random sampling to select the textile firms of Punjab. CEO or someone from the senior management is the participant of the study who respond on behalf of the organization. CEOs and



senior management executives are chosen as the respondents of this study because they possess strategic oversight and decision-making authority regarding both digital transformation initiatives and sustainability strategies within their organizations. The sample size of 240 respondents was determined using the item-to-response ratio approach, maintaining a ratio of 1:10, which is considered adequate for reliable statistical analysis (Hair et al., 2010). A total of 270 questionnaires were distributed to potential participants between February 2025 and August 2025. Of these, 240 were returned fully completed and were deemed usable for the final analysis. To reduce common method bias, respondents were briefed on the study's purpose and assured of complete anonymity and confidentiality in their responses (Podsakoff et al., 2003). Data from respondents were processed and analyzed through SPSS and AMOS software.

3.2. Measures

A five-point Likert scale ranging from (1) “Strongly disagree” to (5) “Strongly agree” was used to measure the items. To measure digital transformational leadership six items were adapted to fit the context of digital transformation from previously developed transformational leadership scales (Podsakoff et al., 1996; Chen & Chang, 2013). Five items were adapted to measure digital transformation (Nasiri et al., 2020). This study measures sustainable performance covering its economic, environmental and social dimensions. All these dimensions were measured using previously studied and well-established sources (Agrawal et al., 2022; Lee & Roh, 2023) covering 5 items of economic performance, 5 items of environmental performance and 5 items of social performance.

4. Analysis and Results

4.1 Demographic Statistics

The demographic profile of the respondents reveals that out of a total of 240 participants, 196 (81.7%) were male and 44 (18.3%) were female. Regarding their functional roles, 92 respondents (38.3%) held positions such as CEO, CIO, or COO, while 77 (32.1%) served as Heads of Sustainability, 47 (19.6%) were Heads of Operations or Supply Chain, and 24 (10%) were categorized under other roles. In terms of working experience, 79 respondents (32.9%) had between 1–5 years of experience, 86 (35.8%) had 6–10 years, 32 (13.3%) had 11–15 years, 29 (12.1%) had 16–20 years, and 14 (5.8%) had over 20 years of experience. Considering the firm size, 40 participants (16.7%) were from organizations with fewer than 250 employees, 83 (34.6%) from firms with 251–500 employees, 85 (35.4%) from those with 501–1000 employees, and 32 (13.3%) from firms with more than 1000 employees. Lastly, regarding firm age, 64 firms (26.7%) were established for 1–5 years, 80 (33.3%) for 6–10 years, 47 (19.6%) for 11–15 years, 28 (11.7%) for 16–20 years, and 21 (8.8%) had been operating for more than 20 years.

Table 1: Demographics of the Study

Demographics	Categories	N	%
Gender	Male	196	81.7
	Female	44	18.3
	Total	240	100.0
Functional Role	CEO/CIO/COO	92	38.3
	Head of sustainability	77	32.1



	Head of Operations/ Supply chain	47	19.6
	Others	24	10.0
	Total	240	100.0
Working Experience	1-5 years	79	32.9
	6-10years	86	35.8
	11-15 years	32	13.3
	16-20years	29	12.1
	More than 20 years	14	5.8
	Total	240	100.0
No of Employees	less than 250 employees	40	16.7
	251-500 employees	83	34.6
	501-1000 employees	85	35.4
	greater than 1000 employees	32	13.3
	Total	240	100.0
Firm Age	1-5 years	64	26.7
	6-10 years	80	33.3
	11-15 years	47	19.6
	16-20 years	28	11.7
	more than 20 years	21	8.8
	Total	240	100.0

4.2 Data Normality Analysis

As shown in Table 2, the data meet the normality criteria. Following Bulmer (1979), skewness values between +1 and -1 indicate normal distribution, and as per MacGillivray and Balanda (1988), kurtosis values within +3 and -3 also confirm normality. Therefore, the data are normally distributed and appropriate for subsequent analyses.

Table 2: Data Mean, Skewness and Kurtosis

Variable	Mean	St. Deviation	Skewness	Kurtosis
Digital Transformational Leadership (DTL)	3.9264	.49932	-.431	1.687
Digital Transformation (DT)	3.8942	.62978	-.507	-.090
Sustainable Performance (SP)	3.7383	.47932	-.168	-.215

The table presents the descriptive statistics for three key study variables: Digital Transformational Leadership, Digital Transformation, and Sustainable Performance. The mean value for Digital Transformational Leadership is 3.93, indicating that, on average, respondents agreed positively with statements related to leadership in digital transformation. The standard



deviation of 0.49 suggests that the responses were fairly consistent with little variation. The skewness value of -0.431 shows a negatively skewed distribution, meaning a few lower scores, while most respondents provided higher ratings. Its kurtosis value of 1.687 indicates a slightly peaked distribution, implying that responses were concentrated around the mean.

For Digital Transformation, the mean score is 3.89, which reflects a generally favorable perception among respondents regarding the level of digital transformation within their organizations. The standard deviation of 0.63 shows a moderate spread of responses. The skewness value of -0.507 also suggests a left-skewed trend, where most participants gave higher ratings. The kurtosis value of -0.090 indicates a fairly normal distribution.

Lastly, Sustainable Performance has a mean of 3.74, revealing that respondents moderately agreed with the performance-related items. Its standard deviation of 0.48 suggests consistency in responses. The skewness (-0.168) and kurtosis (-0.215) values show a near-normal distribution, reflecting balanced responses around

4.3 Reliability and Validity Analysis

According to Ruane (2005), the acceptable threshold for Cronbach's alpha is 0.70, where values above 0.7 indicate good reliability, values exceeding 0.8 represent better reliability, and those above 0.9 reflect excellent internal consistency. As shown in Table 3, all constructs in this study demonstrate Cronbach's alpha values surpassing the 0.7 benchmark, confirming that the measurement scales exhibit strong internal reliability.

Table 3: Reliability Analysis

Variable	Cronbach Alpha	Items	AVE
Digital Transformational Leadership	0.710	06	.610
Digital Transformation	0.805	05	.690
Sustainable Performance	0.800	015	.650

The table provides the reliability and validity results for the study variables: Digital Transformation Leadership, Digital Transformation, and Sustainable Performance. The reliability of each construct is assessed using Cronbach's Alpha, while Average Variance Extracted (AVE) represents the level of convergent validity. For Digital Transformational Leadership, the Cronbach's Alpha value is 0.710, which meets the acceptable threshold, indicating that the six items used to measure this construct are internally consistent and reliable. The AVE value of 0.610 exceeds the minimum acceptable value of 0.50, confirming that the items effectively represent the underlying concept.

The Digital Transformation variable has a Cronbach's Alpha of 0.805, showing a strong internal consistency among its five measurement items. The AVE of 0.690 indicates a high level of shared variance among items, suggesting strong convergent validity and that the construct is well-defined. For Sustainable Performance, the Cronbach's Alpha is 0.800, which demonstrates high reliability across its fifteen items. The AVE value of 0.650 signifies that a substantial portion of variance is captured by the construct rather than by measurement error. Overall, the results show that all variables possess acceptable reliability and validity, making them suitable for further statistical analysis.

4.4 Hetero Trait Mono Trait Method

The table displays the correlation coefficients among the three main study variables: Digital Transformational Leadership (DTL), Digital Transformation (DT), and Sustainable Performance (SP). All correlation values are marked with double asterisks (**), indicating that the relationships are statistically significant at the 0.01 level.

Table 4: Heterotrait -Monotrait Ratio of Correlations (HTMT).

Items	DTL	DT	SP
Digital Transformational Leadership	.650**		
Digital Transformation	.550**	.610**	
Sustainable Performance	.604**	.626**	.670**

The correlation between Digital Transformational Leadership and Digital Transformation is 0.650, showing a strong and positive association. This implies that when leadership effectively supports and guides digital initiatives, the level of digital transformation within the organization tends to increase. Similarly, Digital Transformational Leadership also shows a positive correlation of 0.604 with Sustainable Performance, suggesting that effective leadership in digital initiatives contributes to improved organizational performance and adaptability.

The relationship between Digital Transformation and Sustainable Performance is 0.626, indicating a strong positive link. This means that organizations with higher levels of digital transformation are more likely to achieve better and more sustainable performance outcomes. Additionally, the inter-item correlation for Sustainable Performance itself (0.670) reflects consistency within its measures.

4.5 Correlation Analysis

The table presents the correlation matrix among the three major study variables: Digital Transformational Leadership (DTL), Digital Transformation (DT), and Sustainable Performance (SP). The diagonal values are all 1, representing the perfect correlation of each variable with itself. The off-diagonal values show the degree of relationship among the different variables, with double asterisks (**) indicating that all correlations are statistically significant at the 0.01 level.

Table 5: Correlation Analysis

Items	DTL	DT	SP
Digital Transformational Leadership	1		
Digital Transformation	.550**	1	
Sustainable Performance	.604**	.626**	1

The correlation between Digital Transformational Leadership and Digital Transformation is 0.550, reflecting a moderate to strong positive relationship. This suggests that effective digital transformational leadership contributes significantly to promoting and implementing digital transformation processes within organizations. The correlation between Digital Transformational Leadership and Sustainable Performance is 0.604, showing a strong positive link, meaning that strong leadership in digital transformation tends to enhance organizational sustainable performance.

Similarly, the relationship between Digital Transformation and Sustainable Performance is 0.626, which indicates that higher levels of digital transformation are associated with better



sustainable performance outcomes. Overall, the table demonstrates that all three variables are positively interrelated, implying that capable digital transformational leadership not only strengthens digital transformation efforts but also leads to improved sustainable performance.

4.6 Mediation Analysis

Model : 4

Y : SP

X : DTL

M : DT

OUTCOME VARIABLE:

DT

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5504	.3029	.2776	103.4161	1.0000	238.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1.1686	.2702	4.3257	.0000	.6364	1.7009
DTL	.6942	.0683	10.1694	.0000	.5597	.8286

OUTCOME VARIABLE:

SP

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6989	.4885	.1185	113.1492	2.0000	237.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1.0882	.1833	5.9359	.0000	.7270	1.4493
DTL	.3563	.0534	6.6706	.0000	.2511	.4615
DT	.3213	.0424	7.5863	.0000	.2379	.4047

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.3563	.0534	6.6706	.0000	.2511	.4615

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
DT	.2230	.0419	.1480	.3130

Level of confidence for all confidence intervals in output:95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals: 5000

This presents the results of a mediation analysis conducted through Hayes' (2022) PROCESS macro, Model 4, using SPSS. The analysis explores whether DT (Digital transformation) mediates the relationship between DTL (Digital Transformational Leadership) and SP (Sustainable Performance), based on a sample of 240 participants.

The first section, where DT is the outcome variable, shows that DTL significantly predicts DT ($\beta = 0.6942$, $p < .001$). The model explains about 30.29% of the variance in DT ($R^2 = .3029$), indicating that leadership-driven digital vision and behavior account for a substantial portion of

firms' progress in adopting and integrating digital technologies. The significant F-value (103.4161, $p < .001$) confirms the model's overall fitness.

In the second section, SP is treated as the dependent variable, with both DTL and DT entered as predictors. The model explains 48.85% of the variance in SP ($R^2 = .4885$), suggesting that nearly half of the variation in sustainable performance is accounted for by leadership style and decision-taking behavior. Both predictors have significant positive effects: DTL ($\beta = 0.3563$, $p < .001$) and DT ($\beta = 0.3213$, $p < .001$). This means that while digital transformational leadership directly improves sustainable performance, it also does so indirectly through its influence on digital transformation.

The direct effect of DTL on SP is 0.3563, while the indirect effect through DT is 0.2230. The bootstrap confidence interval for this indirect path (LLCI = 0.1480, ULCI = 0.3130) does not include zero, confirming a significant mediation effect. Therefore, DT partially mediates the relationship between leadership and sustainable performance.

Overall, the results indicate that digital transformational leaders enhance sustainability outcomes not only through direct strategic guidance but also by fostering digital transformation as a key enabling mechanism. This implies that leadership behaviors promoting digital innovation, collaboration, and strategic alignment translate into improved environmental and social performance. In essence, DT serves as a strategic bridge through which leadership intent is operationalized into measurable sustainability performance, reinforcing the pivotal role of DTL in shaping digitally enabled sustainable organizations.

5. Discussion and Conclusion

Drawing on the previous research and theories related to sustainability and institutional pressure, this study found positive impact of digital transformational leadership on digital transformation and sustainable performance in textile sector of Pakistan. Grounded in previous researches, this study hypothesized that digital transformational leadership positively influences sustainable performance ((i.e., H1). The results of this study confirms that DTL has a positive and direct influence on SP. Transformational leaders with their ability to articulate vision, individualized consideration and intellectual stimulation motivate followers to foster culture of innovation and sustainability. (Buil et al., 2019; Avolio, 2004). In today's unpredicted business environment, this leadership plays a crucial role as organizations require not only to meet economic targets but also to respond to social and environmental challenges. Empirical studies reveal that leaders having robust digital orientation can augment organizational agility, inspire eco-innovation and contribute to lasting value-creation (Kraus et al., 2021). Pakistan's textile sector which is facing environmental challenges like carbon emissions and water pollution, in such an environment, leaders who are committed towards sustainability outcomes itself become a competitive advantage for the organization (Malik,2024). Digital transformational leaders hold a futuristic vision that harmonizes digital innovation with sustainability objectives. They synchronize organization's vision, mission, digital initiatives and resources towards long-standing value creation rather short-term profitability.

Similarly, H2 proposed that digital transformational leadership positively impacts digital transformation. The results of the study significantly support H2, showing there is a positive relationship between digital transformational leadership and digital transformation. This finding is aligned with previous literature, signifying that digital transformational leaders are well equipped

to deal organizational change particularly in digital environment (De Waal et al., 2016). The results confirm that transformational leaders encourage digital values and reshape organizational belief system to accept change like digital transformation (Hinings et al., 2018; Sainger, 2018). In a competitive environment, organizations prefer transformational leaders who reconfigure operations to stay relevant in the Industry 4.0 era (Li et al., 2016; Porfirio et al., 2021). Digital transformational leadership present a clear and distinct digital vision. These leaders focus on intellectual simulation, critically reevaluate conventional norms while encouraging novel digital solutions.

Moreover, this research has established the positive influence of digital transformation on sustainable performance (i.e. H3). The use of digital technologies in business processes enhance transparency, foster agility and flexibility that results in boosted efficiency, enhanced productivity, quicker delivery times, cost minimization, eventually contributing to greater sustainable performance (Calatayud et al., 2019). Analytical findings of this study are in line with the earlier work by (Hellemans et al., 2021) and (Nayal et al., 2021) suggesting that digital transformation helps to create an environment suitable for sustainable development, also accomplishing social and economic benefits.

One of the core findings of the study is the mediating role of digital transformation. This is consistent with the results of Warner and Wäger (2019), that digital technologies facilitate firms to adapt their processes and strategies towards sustainable outcomes. In essence, leaders shape the strategic vision while digital transformation translates that vision into concrete sustainable outcome. Digital transformation provides efficient and cost-effective alternatives to attain social and environmental goals along with meeting financial targets. Our results are consistent with the work of Kraus et al., (2021) that DT is not only a technological shift but a strategic connector between leadership's vision and sustainable outcomes. For-instance AI-based forecasting can minimize water and energy waste, blockchain technology ensure ethical sourcing and IoT driven real-time monitoring of resources—all contributing to enhanced sustainable performance (Susanti et al., 2023).

5.1 Theoretical Implications

This research contributes to the progress of New Institutional Theory (NIT) by demonstrating that institutional pressures shape organizations and their responses through digital transformation driven by leadership. First, the study backs NIT by taking Digital Transformational Leadership (DTL) as a crucial organizational mechanism that helps firms to internalize, interpret and respond accordingly to external institutional pressures. In existing literature leadership is plays a pervasive role in organizational agility (Dalvi et al., 2013; Raeisi & Amirnejad, 2017; Akkaya & Tabak, 2020; Wanasida et al., 2020). Whereas, the leadership role in digital transformation and sustainable performance is nascent (Ardi et al., 2020; Porfirio et al., 2021). The notion of how digital transformational leadership may instigate digital transformation and sustainable performance has been underexplored. The findings of this study and conceptual understanding of digital transformational leadership can provide future directions to researchers to explore further this model and yield insights in varied areas such as technology-based workspace behavior and knowledge management.

Second, the model extends NIT by conceptualizing Digital Transformation (DT) an adaptive mechanism rather than merely a technological process. Firms confronting coercive

regulations such as EU CBAM, mimetic pressure from global competitors and normative pressure e.g. sustainability compliances deploy digital technologies not just to enhance efficiency but to get legitimacy and sustain field conformity. This contributes to the theoretical understanding of NIT by explaining that DT plays the role of strategic positioning and institutional compliance rather than just a technical instrument.

Third, the study enriches NIT by associating institutional adaptation to quantifiable sustainable performance (SP). Traditional institutional theory used to focus on legitimacy without discussing performance outcomes. By empirically displaying that DT mediates the relationship between leadership role to institutional pressures and sustainability outcomes, this study highlights conformance to institutional pressures can produce substantive environmental performance gains. This provides the evidence of alignment between institutional pressures, organizations adopting relevant practices and performance outcomes.

5.2 Practical Implications

Although the research focuses on the textile sector in Punjab, its findings offer valuable insights for organizations in other provinces and across different businesses and sectors. This research offers four significant insights. First, Digital transformational leadership should be taken as a strategic necessity rather than a management choice. Textile industry often relies on traditional leadership styles that focuses on short-term financial gains. However, our findings disclose that transformational leaders having a clear and distinct digital vision, encourage innovation, play a crucial role in digital transformation of firms. Programs designed for leadership development, digital literacy drives, and incentives should therefore be restructured to promote polish these capabilities at the middle and top management level.

Second, digital transformation is not only a technology embracing exercise, rather it must be taken as a strategic connector between leadership and sustainability outcomes. Investments in adoption of digital technologies results not merely in better economic outcomes but also contributes towards social and environmental concerns. For instance, AI can reduce water and energy waste by accurately forecasting production demands, blockchain can ensure transparent supply chain, whereas IoT systems can aid in detecting water leakages- all of these address two most tenacious challenges of textile sector of Pakistan i.e. excessive carbon emissions and water pollution.

Third, focus on DL and DT helps firms to stay competitive in global markets. International buyers have increasingly linked procurement choices with sustainability credentials. Firms having digital transformational leadership are readily conform environmental and social governance (ESG) standards, comply with EU Carbon Border Adjustment Mechanism (CBAM) regulatory requirements, and build long-standing trade relationships.

Finally, policy intrusions must back this leadership-technology-sustainability connecting bridge. Government bodies, donor agencies and trade associations should plan capacity building programs, tax leverages for green digital initiatives and public-private collaborations to speedup digital upgradation in textile sector. Synchronizing national textile policies with digital transformation initiatives can significantly contribute to sustainability outcomes, increase exports and benefit Pakistan to fulfil its climate commitments.

5.3 Limitations and Suggestions for Future Research

Although this study has offered several encouraging findings, it also has some limitations that should be addressed. First, this research was conducted on textile sector of Punjab, which is no-doubt the most significant with respect to its size and economic contribution in national total, but it may not fully and truly represent the diverse regulatory, operational and cultural dynamics of other provinces and industries in Pakistan. Future research can use a larger sample for a multi-provincial and multi-sectoral comparative study. Second, this paper opted limited factors that could influence sustainable performance. It would be advisable investigating other variables such as innovation (Abdalla & Nakagawa, 2021), digital culture (Weritz et al., 2020; Abhari et al., 2021), environmental knowledge sharing (Khan et al., 2023). Third, data were collected for this study from only one country i.e. Pakistan. Future research could be done by collecting data from multiple countries with varied digital transformation maturity levels and taking in further cultural factors. Finally, this study used cross-sectional research design which can limit the causal inferences over the period of time. Hence, for future it would be more beneficial to employ a longitudinal study or a case study that would provide a clear understanding of how leadership-driven digital transformation impact sustainability outcomes across time and settings.

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