

Impact Of Digital Leadership On Digital Transformation & Sustainable Performance

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ABSTRACT

In an era of rapid technological change, digital leadership has emerged as vital driver of organizational success thereby fostering digital transformation and ensuring sustainable performance. This study aims to examine the role of digital leadership in accelerating digital transformation processes while maintaining long-term organizational sustainability. In this drive, employing the quantitative approach, this research explores leadership strategies, competencies, and their impact upon digital innovation, employee engagement, and environmental responsibility by collecting¹ data from the teachers hailing from the higher education institutions, Punjab, Pakistan. The findings highlight that institutions with visionary digital leaders are better positioned to leverage technology for the operational efficiency, adaptability, and competitive advantage. Moreover, sustainable performance outcomes are achieved through an integrated focus on digital strategy, employee development, and eco-conscious practices. The study provides some recommendations for fostering digital leadership to drive transformation and sustainability.

Keywords: *Digital Leadership, Digital Transformation, Sustainable Performance & Higher Education*

INTRODUCTION

The digital leadership plays a crucial role in driving digital transformation in organizations as the leaders who understand digital technologies can effectively guide their teams and organizations through process of adopting new technologies, transforming business processes, and leveraging data-driven insights [1]. The digital leaders set clear vision and strategy for digital transformation initiatives, aligning them with organization's goals and objects [2]. They identify opportunities for innovation and disruption, guiding organization towards embracing emerging technologies such as artificial intelligence, and data analytics [3]. The successful digital transformation requires a cultural shift and organizational change as digital leaders inspire and motivate employees to embrace change, fostering culture of innovation, agility, and incessant learning for development. The leader actively communicates paybacks of digital transformation, address concerns, and offer the necessary support for implementation of diverse strategies toward desired transformation [4]. The digital leaders assess the digital maturity of their institutions and identify right technologies to drive transformation [5].

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The leaders invest in digital infrastructure, tools, and talent, ensuring that the institution stays competitive and responsive to evolving market trends and customer demands [6]. The digital leadership promotes collaboration across the different departments and functions, breaking down silos and facilitating cross-functional teamwork. They prioritize interoperability and integration amid digital systems and processes, ensuring seamless communication and data flow across the institution for smooth functioning of institutional different tasks [7]. The digital leadership has significant influence on sustainable performance by leveraging digital technologies and fostering culture of sustainability, institutions can boost environmental stewardship, social responsibility, and economic viability [7]. The digital leaders drive initiatives to reduce the institution carbon footprint, energy consumption, and waste generation over implementation of green technologies, smart systems, and eco-friendly practices [8]. They leverage digital solutions like data analytics, and automation to optimize resource usage, improve energy efficiency, along with minimizing environmental impact [9].

The digital leadership focuses on corporate social responsibility and ethical business practices, promoting diversity, equity, and inclusion within the organization and its chain management. The digital leaders drive sustainable performance by nurturing innovation, efficacy, and resilience in institutional operations as it helps to identify opportunities for value creation and cost savings through digital optimization, process automation, and predictive analytics [10]. So, by embracing sustainability as the strategic priority, organizations can enhance their competitiveness, attract investment, and secure long-term growth and profitability [11]. The digital leadership plays key role in driving both digital transformation and sustainable performance within organizations as by embracing digital technologies, fostering innovation, and promoting sustainability, leaders can position their organizations for success in an increasingly complex and interconnected world [12]. In this connection, the digital leaders play a central role in driving adoption and integration of artificial intelligence knowhows within institution as it articulates clear vision for the digital transformation, emphasizing strategic importance of artificial intelligence in achieving desired organizational goals [13].

Objectives & Hypotheses

1. To examine association among digital leadership, digital transformation and sustainable performance (correlation) (H1).
2. To examine the impact of digital leadership on digital transformation in higher education context (regression) (H2).
3. To examine impact of digital leadership on sustainable performance in higher education context (regression) (H3).

LITERATURE REVIEW

The impact of digital leadership on sustainable performance and digital transformation, features the interconnectedness of leadership, technology, and organizational values in driving holistic organizational change. In this drive, the digital leadership sets the tone for organizational change by articulating a strong vision, and clear strategy [4]. The digital leaders champion sustainability initiatives and digital transformation efforts, emphasizing the standing of leveraging technology and fostering a culture that supports the innovation, agility, and sustainability [10]. The digital leaders leverage artificial intelligence helps to enhance capabilities in areas like data analytics, automation, and decision-making [16]. It enables organizations to optimize the processes, realize sustainability goals toward routine tasks, easing predictive analysis for ensuring desired outcome. The organizational culture plays the critical role in shaping how digital leadership initiatives are received and implemented within

organization as culture that values sustainability, innovation, and collaboration reinforce the impact of digital leadership on sustainable performance and digital transformation [21].

Thus, the digital leaders cultivate a culture that embraces change, encourages experimentation, and empowers employees to contribute to sustainability efforts and digital initiatives [23]. The digital leadership, eased and supported by organization culture, positively influences sustainable performance [27]. By integrating sustainability considerations into strategic decision-making, monitoring and resource optimization, and fostering a culture of sustainability and responsibility, can enhance their environmental stewardship, social impact, and long-term economic viability. The digital leadership offers clear vision and strategic direction for leveraging digital technologies to drive organization change, set priorities for digital transformation and sustainability initiatives, digital leaders align organizational efforts and resources towards achieving desired outcomes [2]. The digital leaders foster culture of innovation, investigation and adaptability within organization and encourage employees to embrace emerging technologies, explore new business models, and challenge the status quo, driving the continuous improvement and innovation across all aspects of the organization [5].

The digital transformation and sustainability initiatives often require significant organizational change [7]. The digital leaders guide employees through these transitions, addressing resistance, overcoming barriers, and fostering openness to change as required from different perspectives. The digital transformation streamlines the processes, automates repetitive tasks, and eliminates inefficiencies, leading to improved productivity and operational excellence as resource utilization and reducing waste, organizations can enhance their sustainability performance while achieving cost savings and operational efficiencies [22]. The digital transformation enables organizations to collect, analyze, and leverage data to make informed decisions [24]. By harnessing power of data analytics, organizations can identify the trends, patterns, and insights that drive better decision-making, optimize resource allocation, and enhance performance across functions, contributing to long-term sustainability goals [21]. Thus, digital transformation fosters a culture of innovation, experimentation, and adaptability within organizations that are required for comprehending the various leading tasks.

The literature revealed that higher education institutions have sustainability embedded within their mission and values, by demonstrating sustainable performance, these institutions align their actions with their core mission of promoting environmental stewardship, social responsibility, and economic practicability [25]. The sustainable performance enhances quality of education and research within higher education institutions [26]. So, integrating sustainability principles into academic programs, research projects, and campus activities, institutions provide students with knowledge, skills, and experiences needed to address complex societal challenges and contribute to sustainable expansion [28]. The sustainable performance skills engage students in eloquent learning experiences and extracurricular activities that promote environmental awareness, social justice, and ethical leadership. The theoretical support for examining impact of digital leadership on digital transformation, sustainable performance in diverse situations and circumstances that be drawn from several established theoretical views in management as well as the organizational studies and contexts [11].

The digital leadership plays a central role in driving digital transformation within organizations. Effective digital leaders articulate a compelling vision, set strategic priorities, and champion the adoption of digital technologies to enable organizational change [10]. The digital leaders inspire and empower employees to hold digital transformation initiatives, fostering culture of innovation, collaboration, and adaptability [17]. Through their leadership, digital leaders guide

organization through complexities of digital transformation, navigating challenges, and seizing opportunities to boost lowness and sustainability [26]. The digital leadership effects sustainable performance by integrating sustainability considerations into digital transformation strategies and initiatives as digital leaders rank sustainability goals, aligning transformation efforts with situation, social and economic objectives. The leadership theory posits that effective leaders inspire and motivate followers to achieve outcomes and promoting organizational change [14]. The digital leadership, as the subtype of transformational leadership, focuses on leveraging digital technologies to drive organizational transformation.

RESEARCH METHODOLOGY

In research, designing a study for research involves careful consideration of various elements to ensure the study is well-structured, methodologically sound, and capable of addressing research questions and hypotheses [29]. The research design of current study is quantitative wherein main aim is to examine the statistical relationships among the research variables (digital leadership, digital transformation, sustainable performance) so as to reach conclusion and making the desired decisions about relationships among these research variables. A well-thought-out strategy helps guide research process, ensures that the research objectives are met, and enhances the validity and reliability of the findings [30]. The choice of research approach is influenced by the nature of the research question, the available resources, and goals of the study [31]. In this linking, there are two primary research approaches: quantitative and qualitative. Moreover, researchers may opt for a mixed-methods approach, combining elements of quantitative and qualitative research which are used in present research.

In research, defining the population and determining the sampling strategy are critical steps that influence generalizability and validity of study [32]. The population is entire group of individuals, cases, or elements that meet the criteria for inclusion in the study. It represents the larger group to which the research findings are intended to be applied. The population of interest in this study consists of the teachers (2788) hailing from higher educational institutions, Punjab, Pakistan. A sample of 350 was selected by using the statistical formula for sample-size determination to select appropriate sampling. Thus, 350 questionnaires were distributed wherein 333 were recollected and used for data analysis. The data collection and analysis are crucial phases in any research study. These processes involve gathering information and transforming it into meaningful insights that address the research questions and hypotheses [33]. The questionnaire for this study was adopted from various previous. Similarly, 5-point Likert scale will be used to record the responses of the respondents.

DATA ANALYSIS

The results of study are presented in this section that are mainly the outcomes of the statistical procedures that are used to examine relationships among the research variables of study in order to extract the desired information and making the required decisions about relationships among research variables.

Table 1 Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|------------------------|-----|---------|---------|--------|----------------|
| Digital Leadership | 333 | 1.30 | 4.80 | 3.2023 | .75509 |
| Digital Transformation | 333 | 1.70 | 4.70 | 3.3339 | .67128 |

| | | | | | |
|--------------------------|-----|------|------|--------|--------|
| Sustainable' Performance | 333 | 1.63 | 4.70 | 3.3387 | .61584 |
| Valid N (listwise) | 333 | | | | |

Table 2 Correlation Analysis (H1)

| | | [1] | [2] | [3] |
|------------------------------|---------------------|--------|--------|--------|
| Digital Leadership [1] | Pearson Correlation | 1 | .490** | .668** |
| | Sig. (2-tailed) | | .000 | .000 |
| | N | 333 | 333 | 333 |
| Digital Transformation [2] | Pearson Correlation | .490** | 1 | .527** |
| | Sig. (2-tailed) | .000 | | .000 |
| | N | 333 | 333 | 333 |
| Sustainable' Performance [3] | Pearson Correlation | .668** | .527** | 1 |
| | Sig. (2-tailed) | .000 | .000 | |
| | N | 333 | 333 | 333 |

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation procedure was used to examine the association among the research variables in order to confirm the strength and association among the desired relationship. The results of the correlation confirmed the association wherein positive and significant association found between digital leadership and digital transformation ($R = .490$ & $P = .000$), the digital leadership and sustainable performance ($R = .668$ & $P = .000$), as well as digital transformation and sustainable performance ($R = .527$ & $P = .000$), thus from correlation results, hypothesis about association is thus accepted from the correlation outcomes thereby confirming the association among desired variables of study.

Table 3 Regression Analysis (H2)

| Model Summary | | | | |
|---------------|-------|----------|-------------------|------------------------|
| Model | R | R Square | Adjusted R Square | Std. Error of Estimate |
| 1 | .490a | .241 | .238 | .58589 |

Table 4 Regression Analysis (H2)

| ANOVA | | | | | | |
|-------|------------|----------------|-----|-------------|---------|-------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 35.987 | 1 | 35.987 | 104.837 | .000b |
| | Residual | 113.620 | 331 | .343 | | |
| | Total | 149.607 | 332 | | | |

Table 5 Regression Analysis (H2)

| Coefficients | | | | | |
|--------------|-----------------------------|------------|---------------------------|---|------|
| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | B | Std. Error | Beta | | |
| | | | | | |

| | | | | | | |
|---|--------------------|-------|------|------|--------|------|
| 1 | (Constant) | 1.938 | .140 | | 13.831 | .000 |
| | Digital Leadership | .436 | .043 | .490 | 10.239 | .000 |
| a. Predictor: Digital Leadership | | | | | | |
| b. Dependent Variable: Digital Transformation | | | | | | |

The regression procedure was used to examine the cause-&-effect relationship between digital leadership and digital transformation thereby using regression procedure. The results confirmed the existence of relationship wherein 24.1% variance occurred in digital transformation is due to digital leadership that has been confirmed through AVOVA outcomes. Moreover, the significant impact of digital leadership is found on digital transformation ($\beta = .436$ & P-value = .000), and thus from regression results and outcomes, the hypothesis about impact is accepted from regression results and outcomes.

Table 6 Regression Analysis (H3)

| Model Summary | | | | |
|---------------|-------|----------|-------------------|----------------------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .668a | .446 | .445 | .45887 |

Table 7 Regression Analysis (H3)

| ANOVA | | | | | | |
|-------|------------|----------------|-----|-------------|---------|-------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 56.219 | 1 | 56.219 | 266.995 | .000b |
| | Residual | 69.696 | 331 | .211 | | |
| | Total | 125.915 | 332 | | | |

Table 8 Regression Analysis (H3)

| Coefficients | | | | | | |
|---|--------------------|-----------------------------|------------|---------------------------|--------|------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.594 | .110 | | 14.524 | .000 |
| | Digital Leadership | .545 | .033 | .668 | 16.340 | .000 |
| a. Predictor: Digital Leadership | | | | | | |
| b. Dependent Variable: Sustainable' Performance | | | | | | |

The regression procedure was used to examine the cause-&-effect relationship between digital leadership and sustainable' performance by using regression procedure. The results confirmed the existence of relationship wherein 44.6% variance occurred in sustainable' performance is due to digital leadership that has been confirmed through AVOVA outcomes. Moreover, the significant impact of digital leadership is evident on sustainable' performance ($\beta = .545$ & P-value = .000), and thus from regression results and outcomes, hypothesis about impact is accepted from regression results and outcomes.

DISCUSSIONS

The digital leaders allocate resources, offer support and champion artificial intelligence initiatives, creating conducive environment for experimentation and innovation [14]. Their leadership raises culture of openness towards new technologies and encourages collaboration between business units and information technologies departments to leverage artificial intelligence for competitive advantage [15]. The artificial intelligence serves as a powerful enabler of digital transformation, unlocking new opportunities for innovation, efficiency, and customer experience that are required towards desired transformations. The literature revealed that over intelligence-driven analytics, automation, and decision support systems, institutions can streamline the processes, optimize operations, and personalize interactions in institutional hierarchy [16]. The artificial intelligence-powered technologies like machine learning, natural language processing, and computer vision enable the organizations to harness data insights, automate routine tasks, and enhance predictive capabilities [17]. This leads to improved agility, responsiveness, and adaptability, main pillars of digital transformation.

The artificial intelligence acts as a mediator in relationship between digital leadership and digital transformation by operationalizing the strategic vision set forth by leaders [18]. The digital leaders create the foundation for transformative change, while amplify the impact of leadership decisions in institution. In institutional progress in digital transformation drive, leaders continually assess the effectiveness of artificial intelligence executions, iterate on strategies, and adapt to changing market dynamics [19]. The artificial intelligence serves as reply loop, providing real-time insight and performance metrics that inform leadership decisions and drive incessant improvement [20]. This iterative process reinforces symbiotic relationship between digital leadership, intelligence, and digital transformation, leading to ongoing innovation and institutional evolution [21]. The digital leadership plays pivotal role in driving digital transformation, with artificial intelligence serving as a key mediator in translating leadership vision into tangible outcomes as embracing AI technologies and fostering a culture of innovation, digital leaders can accelerate the pace towards transformation.

The impact of digital leadership on sustainable performance, with the mediating roles of artificial intelligence and organizational culture, underscores the complex interplay between leadership, technology, and institutional values in fostering the sustainability within organizations [22]. The digital leaders play crucial role in driving the integration of AI technologies within organizations as they set strategy for leveraging to enhance sustainability efforts, like reducing environmental impact, improving working efficiency, and nurturing social responsibility [23]. The digital leaders champion AI initiatives, allocate resources, and create environment for innovation, emphasizing strategic role in achieving sustainability goals [24]. AI serves as powerful enabler of sustainable performance, offering insights that enhance the environmental stewardship, social responsibility, and economic viability. The institutional culture plays the critical role in fostering sustainability by shaping employee attitudes, and norms, as culture that values environmental stewardship, social concern, and ethical business practices reinforces performance wits [25]. The digital leaders cultivate a culture of sustainability by promoting the transparency, accountability, and employee engagement [26].

The leaders empower employees to contribute ideas, participate in sustainability initiatives, and embrace sustainable behavior in day-to-day activities from diverse perspectives toward progress [27]. The artificial intelligence facilitates execution of sustainability initiatives by providing data-driven insights, automating processes, and enabling proactive decision-making that are required for smooth functioning towards the realization of desired leading outcomes. The culture shapes adoption of artificial intelligence for sustainability by influencing employee attitudes towards technology, collaboration, and innovation as culture that holds sustainability values and supports artificial intelligence integration fosters alignment amid leadership vision

and actions, driving sustainable performance outcomes [28]. The institutional progress, digital leaders continually assess effectiveness of culture that supports sustainability initiatives [20]. The digital leadership plays pivotal role in driving sustainable performance, in translating leadership vision into tangible sustainability outcomes [24]. By fostering culture of sustainability, digital leaders create synergies amid technology, culture, strategy to enhance environmental, social and economic performance within institutions.

CONCLUSION

This study highlights the critical role of digital leadership in driving digital transformation while ensuring sustainable organizational performance. It reveals that effective digital leaders not only hold technological innovation but align it with long-term strategic goals, fostering adaptability, resilience, eco-conscious practices. Organizations led by digital-savvy leaders are better equipped to navigate the challenges of digital age, including technological disruptions, employee resistance, and environmental sustainability concerns. Despite the benefits, challenges such as resistance to change, gaps in digital literacy, and resource constraints must be addressed through continuous leadership development and strategic adaptability. The findings underline that the integration of digital leadership practices is essential for the organizations seeking to thrive in an increasingly digital and sustainability-focused global landscape. By bridging the gap between technology and sustainable practices, the digital leaders play a transformative role in shaping the optimistic future of organizational success.

Recommendations

1. The institutions should invest in leadership training programs focused on developing the digital competencies, strategic thinking, and sustainability awareness among current and future leaders.
2. There is a need to align the digital transformation initiatives with sustainability goals to ensure environmental, economic and social responsibility outcomes that may help to guide decision-making.
3. Create an organizational culture that encourages innovation by providing employees with opportunities to learn and experiment with digital tools and solutions to enhance the sustainable practices.
4. Conduct regular digital skills assessments for employees and provide targeted training to bridge gaps in digital literacy in employee development plans to support transformation initiatives for success.

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