“INNOVATION LEADERSHIP AS A DRIVER OF DIGITAL TRANSFORMATION AND PATHWAY TO GREEN GROWTH: EVIDENCE FROM MANAGERS IN DUBAI AND GERMANY”

Research Paper

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“Abstract”

This paper examines whether innovation leadership (IL) drives both the extent and the success of digital transformation (DT) and how successful DT may relate to Green Growth. Using a quantitative, explanatory design, primary data were collected via a structured questionnaire from 30 managers in Dubai and Germany (purposive sampling). IL and DT were measured on 5-point Likert scales. Analyses in SPSS confirmed reliability and validity, normality, and a strong positive association between IL and DT ($r = 0.840$, $p < 0.001$). Regression results showed that IL explains about 71% of the variance in DT ($R^2 = 0.706$, $p < 0.001$), supporting the study’s hypothesis that leadership is a key driver of digital transformation outcomes. While Green Growth was not directly measured, the findings suggest that leadership-driven DT can create conditions for efficiency, eco-innovation, and alignment with the UN Sustainable Development Goals. The study contributes by distinguishing DT existence from success and linking leadership-driven transformation to sustainability priorities.

Keywords: Innovation Leadership, Digital Transformation, Green Growth, Sustainable Development Goals, Organizational Change, Leadership Capacity.

1 Introduction

We are living in a digital age. In the current technological transformation setting, "digitalization and digital transformation" as a change factor is essential for discovering new areas in which digital technology can be applied and implemented to increase organizational efficiency.

However, while many studies examine either digital transformation or leadership, there is limited research on how innovation leadership shapes not only the existence of digital transformation but also its success in delivering meaningful outcomes.

An organization's executives' vision and decision-making that connects digitization to a new organizational need aid in the achievement of such a transformation or change, so top management is responsible for initiating changes inside an organization, and in order for them to do so, they must be persuaded of the benefits and necessity of change for their organization as well as for themselves.

This raises the central research question of this study: Does innovation leadership influence both the extent and the success of digital transformation, and if so, how might successful digital transformation contribute to Green Growth?

This change perspective demonstrates that a central factor in organizational success and growth from the acceptance of any kind of transformation is a leader's vision. So, leaders in organizations adopt

digital transformation ideas in order to break free from old habits and paradigms, as well as to compete with the goal of managing a digital company. Digital transformation is impossible without a leader who develops the platform and motivates stakeholders to act. It is the leader who provides a thoughtful application of technology to generate long-term corporate success (Sainger, 2018).

The objective of this research is therefore twofold:

- To empirically test the influence of innovation leadership on digital transformation, capturing both its existence and its success.
- To conceptually extend the findings to argue how successful digital transformation may enable Green Growth.

Today, most organizations pursue digital transformation since it helps them stay competitive, lower costs, and increase income. Green Growth discourses go beyond restricting economic growth as a strategy of responding to environmental constraints. Green Growth views climate change as an opportunity rather than a cost and promotes environmental investment as a means of "recoupling" environmental conservation with economic growth (Vazquez-Brust, Smith and Sarkis, 2014).

We anticipate that innovation leadership plays a decisive role in shaping not only the extent but also the success of digital transformation, and that successful transformation may provide a pathway to Green Growth.

This paper contributes by:

- Distinguishing between the existence and success of digital transformation,
- Providing empirical evidence from managers in two countries, and
- Linking leadership-driven transformation to Green Growth and the SDGs.

2 Conceptual Foundations and Hypothesis Development

This part examines the core concepts and theoretical foundations that support the research, specifically digital transformation, innovation leadership, and green growth. While digital transformation has been extensively researched in terms of technology adoption and organizational change, and innovation leadership in terms of promoting creativity and directing transformation, few studies have linked these to the growing discussion on green growth. By combining these strands, the review highlights gaps in the literature and offers a framework for exploring how innovation leadership can accelerate digital transformation while fostering long-term economic growth.

In particular, this section integrates background, theoretical grounding, and hypothesis development to establish a clear pathway from leadership to transformation and, ultimately, to sustainable growth.

2.1 Background and context

Digital transformation has become a global priority as organizations seek to maintain competitiveness, reduce costs, and improve value creation. At the same time, increasing environmental pressures and sustainability goals have elevated the importance of Green Growth as a parallel strategic objective. Innovation leadership is a crucial connecting factor that links these agendas by enabling organizations to adopt and successfully implement new technologies while fostering eco-innovation and resource efficiency.

Despite this growing importance, prior studies have often treated these themes separately: digital transformation as a technology and management issue, innovation leadership as a human resource and organizational issue, and Green Growth as an environmental and sustainability issue. This research addresses the gap by integrating them into one coherent framework. This background highlights the need to examine not only whether transformation occurs, but also how successful it becomes and what broader implications it holds for sustainability.

2.2 Digital transformation: existence versus success

Adopting disruptive technologies to increase productivity, value creation, and social welfare is what digital transformation is all about (Ebert and Duarte, 2018). It is undergoing rapid growth and is playing an important role in the development of both public and private organizations (Hai, Van and Tuyet, 2021).

Vial (2019) defined digital transformation as a process that improves an entity by triggering significant changes in its properties through combinations of information, computing, communication, and connectivity technologies (Vial, 2019). Similarly, McKinsey (2024) described it as the fundamental rewiring of an organization's operations, emphasizing that it involves continuous adaptation rather than one-time deployment. The increasing digitalization of economies underscores its relevance for competitiveness (McKinsey, 2024).

Ebert and Duarte (2018b) explored how digital transformation affects the software industry, while Kraus et al. (2022) examined the growing interest in DT research across governments and sectors (Ebert and Duarte, 2018). Bonnet and Westerman (2020) emphasized that success in DT is driven more by strategy than technology (Bonnet and Westerman, 2020). Lamarre et al. (2023) showed that although 89% of large companies implement digital and AI transformations, only a fraction achieve expected benefits (Lamarre et al., 2023).

This highlights a critical insight: while digital transformation initiatives are common, successful outcomes remain difficult to achieve. This distinction between existence (adoption) and success (strategic outcomes) provides the foundation for our empirical analysis. From a theoretical perspective, the Dynamic Capabilities Theory (Teece, 2023) explains this gap: organizations must continuously sense opportunities, seize resources, and transform processes. DT can be viewed as such a capability, but its success depends on leadership’s ability to embed technology into strategy and culture.

2.3 Innovation leadership as a driver of transformation

Innovation, understood as the implementation of creative ideas, is a key factor of competitive advantage (Kremer, Villamor and Aguinis, 2019). Leadership is described as a process of social influence that maximizes others' efforts to achieve a goal (Kruse, 2013). Effective leadership establishes the vision, strategy, and environment in which innovation may thrive. Leaders who are visionary, adaptive, and supportive can foster a culture of experimentation and new ideas.

Research indicates that leadership significantly impacts creativity and innovation. Appio et al. (2021) noted that research at the intersection of DT and innovation management remains fragmented and lacks a unifying framework (Appio et al., 2021). Other studies highlight that having a defined digital strategy, a risk-taking culture, and ongoing innovation are critical for digital maturity. Şen and Eren (2012) emphasized the importance of innovative leadership in today’s fast-changing global context, while Agbor (2008) argued that creativity and innovation led by strong leadership ensure long-term success (Şen and Eren, 2012).

Taken together, these studies position innovation leadership as a decisive factor in ensuring that DT is not only initiated but also implemented successfully. This aligns with Innovation Leadership Theory (Mumford et al., 2002), which highlights leadership’s role in shaping vision, supporting risk-taking, and guiding organizational learning. In this study, innovation leadership is therefore positioned as the enabler of successful DT.

2.4 Green growth and sustainability pathways

Green growth refers to fostering economic growth and development while ensuring that natural assets continue to provide resources and environmental services on which our well-being relies (Capasso et

al., 2019). International bodies such as the OECD and UNESCAP emphasize its role in balancing prosperity with environmental protection.

A green economy can open new markets and create competitive advantage, while also ensuring sustainability (Samad and Manzoor, 2015). Although Green Growth was not empirically tested in this study, literature suggests that successful DT—through efficiency gains, automation, and innovation—creates favorable conditions for advancing sustainability goals. This also connects to the United Nations' 17 Sustainable Development Goals (SDGs), particularly those on innovation and infrastructure (SDG 9), responsible consumption and production (SDG 12), climate action (SDG 13), and partnerships (SDG 17).

The Triple Bottom Line (Elkington and Rowlands, 1999) further frames this argument, showing that successful DT can simultaneously deliver economic (profit), social (people), and environmental (planet) benefits, thereby contributing to Green Growth.

2.5 Integrating leadership, transformation, and growth

The global financial crisis highlighted the need for alternative models of growth that combine technological change with social and environmental responsibility (Zhuravleva and Poliak, 2020). Studies confirm that digital transformation can improve energy efficiency, foster eco-innovation, and support downstream sustainability when supported by digital finance and public environmental concern (Song, 2025).

Leadership is a key factor moderating these effects, as it determines whether technological adoption translates into sustainable outcomes (Resanovich, Hopthrow and de Moura, 2024). Scholars further emphasize that successful digital transformation relies heavily on innovation leadership practices such as trust-building, agile strategies, and transformational leadership styles (Nguyen Hai, Van and Tuyet, 2021).

This integrated perspective directly supports our hypothesis. The theoretical grounding comes from the Resource-Based View (Barney, 1991; Barney, Wright and Ketchen, 2001), which frames innovation leadership and digital transformation as strategic resources. When aligned with Dynamic Capabilities and Innovation Leadership Theory, these resources enable adaptability and sustainable competitive advantage, with Green Growth as the ultimate outcome.

2.6 Hypothesis development

Drawing from the literature, several points become clear:

- Digital transformation is widespread but not always successful.
- Innovation leadership is consistently identified as a key driver of success in organizational change.
- Successful digital transformation is increasingly linked to sustainability outcomes such as Green Growth.

Therefore, we state the following comprehensive hypothesis:

H: Innovation leadership positively influences both the extent and the success of digital transformation, which in turn creates a pathway for Green Growth.

3 Methodology

3.1 Research design

The study was designed to examine the role of innovation leadership in digital transformation. A quantitative approach was selected because it allows the use of standardized measures and produces statistical evidence for testing the hypothesis. Primary data was used, collected directly from managers, so that their own views and experiences could be reflected. The main tool for collecting information was a structured questionnaire survey. This was considered appropriate because the aim was to measure managers' perceptions and organizational practices at one point in time. In general, the research design can be described as explanatory and quantitative, which is suitable for analyzing the relationships between the study variables.

3.2 Sampling and data collection

The research was carried out with a sample of 30 managers working in companies located in Dubai and Germany. A purposive sampling method was used in order to select respondents who had relevant knowledge about leadership and organizational change. Although this type of sampling does not allow results to be generalized to a larger population, it is useful for focusing on specific groups that can provide meaningful insights.

The questionnaire was created using Google Forms and distributed electronically. Invitations were sent by email and LinkedIn messages. This method made it possible to reach managers in different companies in an efficient way and ensured voluntary participation.

3.3 Research instrument

The study relied on a structured questionnaire as the main instrument for data collection. Before answering, participants were informed that their responses would be kept anonymous and that they could withdraw at any time. Consent was obtained electronically when participants decided to continue with the survey.

The questionnaire was divided into two sections and used a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The first section measured Innovation Leadership (IL) through 10 items covering vision, collaboration, risk-taking, and support for innovation. The second section measured Digital Transformation (DT) through 10 items related to the use of digital technologies, customer interaction, and integration into organizational processes. The items were written in simple and clear language to avoid confusion and to reduce bias.

3.4 Data analysis

The collected data was analyzed with the SPSS software. Reliability of the items was tested using Cronbach's Alpha, and construct validity was checked through Exploratory Factor Analysis (EFA) supported by the Kaiser-Meyer-Olkin (KMO) statistic and Bartlett's Test of Sphericity.

Normality of the data was examined through the Shapiro-Wilk and Kolmogorov-Smirnov tests, as well as skewness and kurtosis values. The relationships between variables were then analyzed using Pearson correlation. Finally, regression analysis was applied to see how innovation leadership predicts digital transformation. The results were presented with model summary and coefficient tables to show the strength and significance of the relationships.

This process ensured that the data was reliable and suitable for testing the proposed hypothesis.

3.5 Ethical considerations

The research followed basic ethical principles. Respondents were given information about the aim of the study, how their data would be used, and their right to withdraw at any time. Participation was voluntary, and no personal identifiers were collected. All responses were kept confidential and anonymous.

3.6 Methodological limitations

The study has some limitations. The sample size was relatively small and restricted to managers in Dubai and Germany, which limits how far the results can be generalized. The use of purposive sampling may also introduce some bias. In addition, no control variables (e.g., firm size, industry) were included due to sample size constraints, which limits the ability to account for contextual effects. The data is also based on self-reported answers, which can be influenced by personal interpretation. These limitations should be considered when interpreting the findings, and future research could use larger and more diverse samples, include control variables, or combine quantitative and qualitative methods to gain richer insights.

4 Results

This part of the study presents the findings from the data analysis. The main purpose was to test how innovation leadership (IL) influences digital transformation (DT). SPSS was used to analyze the data, and different tests were carried out including reliability, validity, normality, correlation, and regression.

4.1 Reliability and validity

The results of the reliability test showed that both variables were reliable. Cronbach's Alpha for innovation leadership was 0.89 and for digital transformation it was 0.87, which are both higher than the minimum required value of 0.70 (Taber, 2018). This means that the items in the questionnaire were consistent in measuring the constructs.

Construct	Items	Cronbach's Alpha
Innovation Leadership	10	0.89
Digital Transformation	10	0.87

Table 1. Reliability Results

In addition, the Kaiser-Meyer-Olkin (KMO) value was 0.82 and Bartlett's Test of Sphericity was significant ($p < 0.001$). These results confirmed that the dataset was appropriate for factor analysis and that the items grouped well under their respective constructs.

4.2 Normality

Normality was tested using Shapiro-Wilk and Kolmogorov-Smirnov, as well as skewness and kurtosis values (Ahmad and Khan, 2015).

Variable	Kolmogorov-Smirnov (p)	Shapiro-Wilk (p)	Skewness	Kurtosis
Innovation Leadership	> 0.05	> 0.05	Within ±1	Within ±1
Digital Transformation	> 0.05	> 0.05	Within ±1	Within ±1

Table 2. Tests of Normality

All results were within acceptable ranges ($p > 0.05$ for both tests), confirming that the data was normally distributed and suitable for parametric testing.

4.3 Correlation analysis

The correlation analysis examined the strength and direction of the relationship between innovation leadership (IL) and digital transformation (DT). The results showed a strong and positive correlation, with a Pearson coefficient of $r = 0.840$ at a significance level of $p < 0.001$. This indicates that higher levels of innovation leadership are strongly associated with greater levels of digital transformation in organizations.

Variables	**IL**	**DT**
Innovation Leadership	1	0.840**
Digital Transformation	0.840**	1
**. Correlation is significant at the 0.01 level (2-tailed). N=30		

Table 3. Correlation between IL and DT

The strength of this correlation suggests that innovation leadership is not only related to whether digital transformation exists, but also to how effectively it is implemented. This finding is in line with the hypothesis and supports the idea that leadership plays a central role in ensuring the success of transformation initiatives. The significance level of $p < 0.001$ indicates that there is less than a 1% probability that this relationship occurred by chance, which provides strong evidence that the correlation is statistically meaningful.

4.4 Regression analysis

Regression analysis was carried out to test how much innovation leadership explains digital transformation. The results summarized in Table 4 and Table 5 show that the model was significant with an R^2 value of 0.706. This indicates that about 71% of the changes in digital transformation can be explained by innovation leadership.

Model	**R**	**R^2**	**Adjusted R^2**	**Std. Error**
1	0.840	0.706	0.696	0.38905

Table 4. Regression Model Summary

The R^2 value of 0.706 shows that innovation leadership explains about 71% of the variation in digital transformation. The Adjusted R^2 value of 0.696 is almost the same, which means the model is reliable and not overstated by the sample size or number of predictors.

Predictor	**B**	**Beta**	**t**	**Sig.**
Constant	0.382	–	0.940	0.355
Innovation Leadership	0.870	0.840	8.206	<.001

Table 5. Regression Coefficients

The coefficient for innovation leadership (B = 0.870, p < 0.001) shows that for every one-unit increase in innovation leadership, digital transformation increases by about 0.87 units. The strong t-value (8.206) and very low significance level confirm that this effect is statistically meaningful. The ANOVA also supported this result.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	10.193	1	10.193	67.345	<0.001
Residual	4.238	28	0.151		
Total	14.432	29			

Table 6. ANOVA Results

The F-value was 67.345 and the significance level was p < 0.001, which confirms that the model is statistically significant. This means innovation leadership as a predictor contributes strongly to explaining digital transformation outcomes.

Figure 1 illustrates the relationship between innovation leadership and digital transformation. The scatterplot shows individual responses from managers, and the fitted regression line indicates a clear upward trend. This means that higher levels of innovation leadership are associated with greater levels of digital transformation, which supports the study's hypothesis.

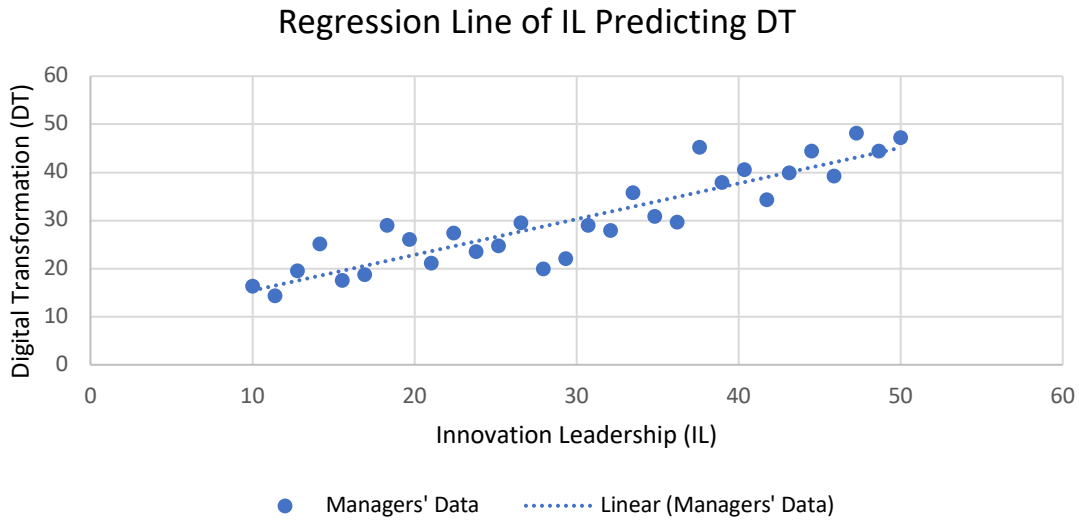

Figure 1. Regression Line of IL Predicting DT

The tests confirmed that the constructs were reliable and valid, the data met normality requirements, and IL showed a strong positive correlation with DT. Regression analysis confirmed that IL explains 71% of the variance in DT.

4.5 Hypothesis testing

The hypothesis of this study stated that innovation leadership positively influences both the extent and the success of digital transformation, which in turn creates a pathway for Green Growth.

The results strongly support the first part of the hypothesis. Correlation and regression analysis confirmed that innovation leadership is a significant predictor of digital transformation (r = 0.840, p <

0.001; $R^2 = 0.706$, $p < 0.001$). This shows that organizations with stronger innovation leadership are more likely to achieve digital transformation and reach better results.

The second part of the hypothesis, which links digital transformation to Green Growth, was not directly quantitatively tested. However, the findings can be related to sustainability outcomes that are consistent with the UN Sustainable Development Goals (SDGs). For example, successful digital transformation can improve efficiency in energy use (SDG 7), support sustainable economic growth (SDG 8), modernize industries (SDG 9), reduce waste through responsible production (SDG 12), and contribute to climate action (SDG 13). It can also strengthen partnerships across organizations and countries (SDG 17) (Cordova and Celone, 2019).

Taken together, the findings support the hypothesis in relation to digital transformation and provide a strong theoretical connection to sustainability goals. Innovation leadership not only drives digital transformation but also creates the conditions for organizations to align with global sustainability priorities and Green Growth.

5 Conclusion

The results of this study provide clear evidence that innovation leadership plays a major role in driving digital transformation. The findings showed that innovation leadership not only influences whether digital transformation takes place, but also how successful it becomes. The regression analysis confirmed this by showing that innovation leadership explains about 71% of the variation in digital transformation.

These findings are consistent with earlier studies that highlighted the importance of leadership in transformation processes. For example, Westerman and Bonnet (2020) argued that strategy and leadership, rather than technology alone, are the key drivers of digital maturity (Bonnet and Westerman, 2020). Similarly, Hughes et al. (2018) and Agbor (2008) emphasized that leaders who provide vision and support for innovation create the conditions for organizational change. The strong positive correlation found in this study therefore aligns with the broader literature that sees leadership as central to digital success (Agbor, 2008; Hughes *et al.*, 2018).

Beyond confirming earlier work, this study also adds new insights by connecting digital transformation with wider sustainability discussions. The results support the view that successful transformation creates favorable conditions for resource efficiency, eco-innovation, and climate-friendly growth. This connects directly to the United Nations Sustainable Development Goals (SDGs), particularly those related to clean energy (SDG 7), economic growth (SDG 8), innovation and infrastructure (SDG 9), responsible production (SDG 12), climate action (SDG 13), and partnerships for sustainability (SDG 17). In this way, the pathway IL → DT → GG links leadership, technology, and global sustainability priorities.

The practical implications for managers are significant. The findings show that investing in leadership capabilities is just as important as investing in new technologies. Leaders who encourage collaboration, vision, and risk-taking are more likely to deliver digital transformation that succeeds. Managers should also connect digital transformation efforts with sustainability strategies by setting KPIs that measure not only financial performance but also environmental and social outcomes. Developing leadership training programs, linking digital projects to sustainability goals, and building partnerships around eco-innovation are all steps that can help organizations align transformation with long-term sustainability.

Taken together, the study confirms the hypothesis by showing that innovation leadership drives both the extent and success of digital transformation. It also strengthens the conceptual link between digital transformation and Green Growth, showing that leadership in digital change is not only a technological driver but also a strategic enabler of long-term sustainability.

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