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Exploring the Impact of Responsible Artificial Intelligence on Creativity: The Role of Entrepreneurial Leadership in Enhancing Government Performance in Qatar

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ABSTRACT

This study addresses a contemporary topic represented in "Responsible Artificial Intelligence" and its relationship with "Creative Performance" in government institutions in the State of Qatar, while analyzing the mediating role played by "Entrepreneurial Leadership." This study comes in light of the accelerating global trends toward adopting artificial intelligence technologies in the governmental sector, contributing to improving service quality and achieving digital transformation, as emphasized in Qatar National Vision 2030. The descriptive-analytical method was used, relying on a quantitative survey through a questionnaire distributed to a sample of 150 leaders in the Qatari governmental sector who met specific knowledge and job-related criteria. The questionnaire covered three main variables: Responsible AI (RAI) with its four dimensions (accountability, responsibility, transparency, and ethical empathy), Entrepreneurial Leadership (ELD), and Creative Performance (INNP). The data was analyzed using Structural Equation Modeling (SEM) via AMOS 22 to test direct and indirect hypotheses. The results showed no statistically significant direct relationship between Responsible AI and Creative Performance, while a strong positive relationship was found between Responsible AI and Entrepreneurial Leadership, as well as between Entrepreneurial Leadership and Creative Performance. The analysis confirmed a full mediation effect of Entrepreneurial Leadership in the relationship between Responsible AI and Creative Performance, meaning that the effect of AI is only achieved through an effective leadership channel. The study concluded that the ethical use of technology, represented solely by Responsible AI, is insufficient to achieve institutional creativity unless activated by conscious entrepreneurial leadership capable of transforming technological capabilities into innovative solutions. The study recommends empowering government leaders through leadership development programs focused on entrepreneurship and innovation, and establishing clear regulatory frameworks for Responsible AI that enhance trust and creativity within government institutions.

Keywords: Responsible Artificial Intelligence (RAI); Entrepreneurial Leadership; Creative Performance; Public Sector Innovation; Digital Transformation (Qatar).

INTRODUCTION

The world is witnessing rapid advancements in Artificial Intelligence (AI), which has become an essential tool for improving operations and decision-making across sectors, including the government. However, these advancements bring challenges related to the responsible and ethical use of AI, giving rise to the concept of "Responsible Artificial Intelligence" (RAI), which refers to the development and use of AI technologies in ways that ensure transparency, fairness, privacy, and accountability while minimizing misuse risks and maximizing social and economic benefits (Saudi Data & AI Authority, 2024).

In the State of Qatar, the nation has adopted an ambitious vision—Qatar National Vision 2030—which aims to achieve sustainable development through transitioning into a knowledge- and innovation-based economy (General Secretariat for Development Planning, 2008). The governmental sector plays a central role in achieving this vision by providing high-quality services that meet societal expectations. However, the complex and constantly changing environment poses significant challenges for government entities, including the need to adapt to technological transformations and continuously innovate to enhance efficiency and effectiveness.

AI tools such as ChatGPT, Copilot, Gemini, and others are widely used across institutions, but their effectiveness depends heavily on how they are used. In the government sector, Responsible AI can improve performance by enhancing decision-making capabilities, improving service quality, and offering innovative solutions to complex challenges. Responsible use of these tools extends beyond technical aspects to encompass leadership, governance, and ethics. Achieving these benefits requires leaders who can adopt and direct these technologies to advance institutional goals. This is where Entrepreneurial Leadership becomes essential, characterized by leaders who possess future-oriented vision and the ability to stimulate innovation in their institutions. Recent studies indicate that entrepreneurial leaders can respond to new challenges with flexibility and creativity (Al-Nafrawi, 2024). They play a key role in building an organizational culture that supports renewal and creativity while promoting responsible use of technology to achieve institutional objectives.

Creative Performance is considered one of the most important indicators of institutional success (Baryniene & Dauknyte, 2015), as it reflects the institution's ability to develop innovative solutions to improve service quality and increase beneficiary satisfaction. In government institutions, achieving creative performance requires a work environment that supports innovation and is backed by the necessary technical and human resources. Responsible AI is a key element in enhancing institutional creativity by providing tools that improve data analysis, predict future needs, and optimize resource utilization. However, these benefits can only be realized if AI tools are integrated within an effective leadership framework characterized by vision and entrepreneurship.

Accordingly, this study aims to analyze the relationship between Responsible AI and Creative Performance in Qatari government institutions, focusing on the mediating role of Entrepreneurial Leadership. The study seeks to present an integrated perspective that supports the development of innovative strategies to improve public services and ensure the ethical use of technology. By analyzing this relationship, the study aims to provide clear insights into how to enhance innovation in government institutions, ensure responsible AI practices, and highlight the role of entrepreneurial leaders in achieving these goals.

Despite the widespread adoption of AI technologies in the government sector, institutions still face fundamental challenges in ensuring responsible use and maximizing their contribution to creative performance. Reports by the OECD have indicated that adopting AI without a clear ethical framework may lead to issues such as biased decision-making and a lack of transparency (Yeung, 2020). European studies also highlight that the absence of ethical principles in AI applications can negatively affect public trust in government institutions (STOA, 2020).

On the other hand, digital transformation in government institutions is a complex process that requires effective entrepreneurial leadership to guide the adoption of technology in ways that support innovation and turn challenges into opportunities. Research shows that leaders with entrepreneurial skills can create work environments that encourage creativity and apply technological solutions responsibly (Davenport & Ronanki, 2020). However, previous research has not sufficiently addressed the integrative relationship between Responsible AI and Creative Performance, while highlighting the mediating role of Entrepreneurial Leadership.

The significance of this research lies in addressing a modern and vital topic that combines Responsible AI, Entrepreneurial Leadership, and Creative Performance in the context of government work. This study contributes theoretically by filling a knowledge gap regarding the relationship between Responsible AI and Creative Performance and presenting a framework that clarifies the mediating role of Entrepreneurial Leadership. It contributes to the literature on public administration, technology, and innovation by offering a model applicable across diverse work environments. At the practical level, the study offers guidelines for government entities on employing Responsible AI to improve creative performance and service quality, enabling decision-makers to understand key success factors for AI adoption. It also provides recommendations to support entrepreneurial leaders in driving digital transformation and contributes to achieving Qatar National Vision 2030 by strengthening innovation and building a high-efficiency smart government.

This research is divided into five main parts. The first part presents the general framework, including the introduction, problem statement, objectives, significance, hypotheses, general methodology, population and sample, research instrument, limitations, and research structure. The second part presents the theoretical framework for the study variables—Responsible AI, Entrepreneurial Leadership, and Creative Performance—along with an analysis of relevant prior studies. The third part focuses on the research methodology, explaining the population and sample, the sampling method, the data collection instrument and procedures, and the statistical techniques used. The fourth part is dedicated to data analysis and presentation of statistical results, including sample

description and hypothesis testing using structural analysis models. The fifth part discusses the results, presents conclusions, highlights theoretical and practical contributions, and provides recommendations and suggestions for future research, concluding with a summary of the study's key findings.

Study Objectives

This research aims to examine the impact of Responsible AI on Creative Performance in the governmental sector in the State of Qatar, with a focus on the mediating role of Entrepreneurial Leadership. It seeks to provide more profound understanding of the relationship between modern technology and effective leadership in achieving outstanding performance and enhancing creativity in government services.

Main Objectives:

- Analyze the impact of Responsible AI on Creative Performance: identifying how Responsible AI can contribute to enhancing institutional creativity and improving the quality of government services.
- Evaluate the mediating role of Entrepreneurial Leadership: examining how Entrepreneurial Leadership influences the relationship between Responsible AI and Creative Performance.

Sub-Objectives:

- Identify the factors influencing the adoption and responsible use of AI technologies within Qatari government institutions.
- Understand the challenges associated with implementing Responsible AI in the governmental sector.
- Measure the extent to which Entrepreneurial Leadership affects innovation and creativity within the governmental work environment..

Study Questions

The following main research question guides this research:

What is the impact of Responsible AI on Creative Performance in the governmental sector in Qatar, and what is the mediating role of Entrepreneurial Leadership in this relationship?

The following sub-questions support the main question:

1. To what extent does Responsible AI affect Creative Performance in government institutions?
2. How does Entrepreneurial Leadership influence the relationship between Responsible AI and Creative Performance?
3. What factors influence the effectiveness of adopting Responsible AI to enhance creativity within government institutions?

THEORETICAL FRAMEWORK

Responsible Artificial Intelligence (Responsible AI)

Responsible Artificial Intelligence refers to an ethical and technical framework that ensures the development and use of AI technologies in ways that consider fairness, transparency, accountability, and privacy protection (Floridi et al., 2018), in response to concerns about the use of intelligent systems in sensitive decision-making. Dignum (2019) emphasized that this concept is based on core principles, including accountability, responsibility, transparency, and ethical empathy, which was confirmed by Jobin et al. (2019) in their analysis of 84 global ethical documents. The literature also indicates that implementing Responsible AI requires less legal and normative fragility, especially in highly sensitive governmental institutions. Kurre (2024) identified challenges governments face in aligning technological efficiency with ethical values.

The fundamental dimensions of Responsible AI—according to Dignum (2019) and charters such as the EU Charter (European Commission, 2019) and OECD Principles (2021)—are: accountability, as confirmed by Papagiannidis et al. (2025) and Jobin et al. (2019); responsibility, as discussed by Gasser & Almeida (2017) and Fjeld et al. (2020); transparency, as addressed by Arrieta et al. (2020), Morley et al. (2020), and Pizzi et al. (2020); and ethical empathy, as explained by UNESCO (2021). Sharkey (2014) emphasized its risks, while Bryson (2020) recommended minimal ethical intervention.

This field faces key challenges including the complexity of deep learning models (Arrieta et al., 2020), lack of legislation (Al-Shourb, 2024), data bias (Gupta et al., 2023), and the gap between principles and practice (Morley et al., 2020). Most applications have focused on the health and banking sectors (Kumar et al., 2023; Ratzan & Rahman, 2024), highlighting the need to study Responsible AI in the governmental context..

Entrepreneurial Leadership

Entrepreneurial Leadership represents a leadership style that combines future-oriented vision, initiative, innovation, opportunity exploitation, and risk-taking. Gupta et al. (2004) defined it as influencing others through future vision, calculated risk-taking, and resource utilization. In contrast, Bagheri & Harrison (2020) viewed it as a framework grounded in innovation and strategic thinking.

Entrepreneurial Leadership is based on multiple dimensions, including: strategic vision as explained by Yousef (2020), initiative (Al-Hindal & Taha, 2022), risk-taking (Al-Sarayrah, 2025), opportunity exploitation (Al-Amro & Al-Zoubi, 2022), empowerment and motivation (Bagheri & Harrison, 2020), and support for creativity (Abd-Elhady et al., 2023).

Its importance is particularly evident in the governmental context amid digital transformation. Sa'diyah et al. (2022) demonstrated its role in enhancing public sector resilience after the COVID-19 pandemic, while Abdel Azim et al. (2025) showed its impact on improving university decision-making. Entrepreneurial Leadership is closely associated with creativity, as demonstrated by Al-Amro & Al-Zoubi (2022) regarding strategic renewal, and Abd-Elhady et al. (2023), which showed the mediating role of organizational agility.

Creative Performance

Creative Performance is defined as the institution's ability to generate new ideas and implement them into effective solutions that enhance institutional excellence (Amabile, 1996). It depends on dimensions including originality (Runco & Acar, 2012; Kaufman & Sternberg, 2010), fluency (Cropley, 2001), flexibility (Runco & Acar, 2012), and appropriateness (Kaufman & Sternberg, 2010).

Creative Performance is influenced by individual and organizational factors, including intrinsic motivation (Abbas, 2021), organizational culture (Al-Najjar et al., 2021), entrepreneurial leadership (Abd-Elhady et al., 2023), and technological and cognitive infrastructure (Ahmed, 2025).

Although previous studies focused mainly on the private sector, Demircioglu & Audretsch (2017) found that internal factors—such as experimentation and feedback—are most influential in the public sector, while Al-Nafrawi (2024) emphasized the importance of strategic flexibility in supporting creativity. Creative Performance is also linked to technology, as explained by Ahmed (2025) regarding the impact of IoT through knowledge management, and by AbouShouk (2024) regarding the role of knowledge acquisition and exploitation. It is similarly linked to entrepreneurial leadership, according to Abbas (2021) and through organizational agility as shown by Abd-Elhady et al. (2023).

Related Studies

A review of the literature on Responsible AI, Entrepreneurial Leadership, and Creative Performance reveals increasing interest in these topics over the last decade, alongside expanding research into the ethical and technical dimensions of AI, the role of entrepreneurial leadership in dynamic work environments, and the drivers of creative performance.

In the field of Responsible AI, a number of studies focused on developing tools to measure maturity and practical applications. For example, Ratzan & Rahman (2024) developed a maturity measure for AI in the banking sector, while Kumar et al. (2023) demonstrated that Responsible AI enhances market value in the health sector. Gupta et al. (2023) showed that increasing risks associated with AI encourage wider adoption of Responsible AI.

Other studies discussed ethical and regulatory aspects, such as Al-Shourb (2024) and Ziyada (2024). Studies also addressed explainable AI (XAI) as an approach to transparency, such as Arrieta et al. (2020), or examined AI governance in sovereign environments as in Kurre (2024). More recent studies, such as those by Correa De Ysasi (2025) and Bauer (2025), addressed security and social challenges associated with generative and health AI. Alkire et al. (2024) provided a strategic framework (RAISE) for implementing Responsible AI in service sectors, while Papagiannidis et al. (2025) presented a comprehensive review of Responsible AI governance methodologies.

In the field of Creative Performance, studies agreed on the importance of organizational, leadership, and technological factors in enhancing creativity. Al-Nafrawi (2024) demonstrated that strategic flexibility serves as a mediator between entrepreneurial leadership and creative performance, while Abbas (2021) found that intrinsic and social motivations are essential mediators of the influence of entrepreneurial leadership on creativity.

Other studies found that creative self-efficacy plays a key role in supporting creative behavior (e.g., Al-Qatran & Al-Abro, 2024).

In governmental and educational contexts, Al-Rashidi et al. (2023) found that administrative deficiencies limit creativity, while Demircioglu & Audretsch (2017) emphasized that experimentation and feedback are more influential than financial resources in enhancing creativity in the public sector. Studies such as Edquist et al. (2018), Zhao et al. (2016), and Greco et al. (2015) highlighted the importance of open innovation and appropriate metrics for evaluating creative performance.

Other studies focused on technology and knowledge management, such as Ahmed (2025) and AbouShouk (2024), as well as those examining servant leadership and creative culture, such as Ren & Shen (2024), and the school and university environment as in Al-Hejazeen (2017), Al-Shehri (2022), and Haji & Faeq (2023).

Regarding Entrepreneurial Leadership, literature views it as an approach to institutional transformation and innovation. Studies by Nusrat et al. (2025), Al-Amro & Al-Zoubi (2022), and Abd-Elhady et al. (2023) confirmed that Entrepreneurial Leadership directly contributes to boosting innovative renewal and creative behavior, and that this influence increases through mediators such as proactive personality, affective commitment, and organizational agility. Abdel Azim et al. (2025) and Al-Hindal & Taha (2022) examined the reality of Entrepreneurial Leadership in the academic context. They highlighted the need to support leaders' skills to improve institutional excellence.

Other studies, such as Bagheri & Harrison (2020) and Fontana & Musa (2017), discussed developing accurate measures for Entrepreneurial Leadership, while Yousef (2020), Taha (2020), and Eid (2022) offered strategic insights into its role in improving the quality of work life and institutional performance.

Al-Sarayrah (2025) and Ali (2023) demonstrated the effect of Entrepreneurial Leadership on organizational success and internal efficiency, while Sa'diyah et al. (2022) presented a perspective on the role of Entrepreneurial Leadership in navigating digital transformations in the governmental sector.

The collective body of studies shows that although the literature addressed each variable—Responsible AI, Entrepreneurial Leadership, and Creative Performance—extensively, it often focused on commercial or specific contexts, and there are few studies combining the three variables within a single model, especially in the Arab governmental sector. It is also evident that Responsible AI is still studied primarily from isolated technical or ethical perspectives, without integration into explanatory models that analyze its influence on creativity or its role in enabling leadership. Entrepreneurial Leadership has been clearly linked to creative behavior and innovation. However, it has not been studied as a mediator between Responsible AI and Creative Performance, representing a clear research gap that the present study aims to address.

Study Variables and Hypotheses

Structure of the Study Variables:

This research is based on a conceptual model that clarifies the relationship between three main variables: Responsible Artificial Intelligence as the independent variable, Entrepreneurial Leadership as the mediating variable, and Creative Performance as the dependent variable, as illustrated in the following figure::

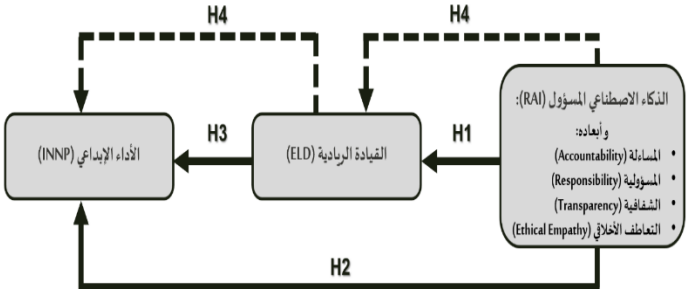

Figure 1. Structure of Study Variables

These variables were selected based on contemporary literature that links the use of modern technology and effective leadership to achieving excellence and innovation in institutions.

Independent Variable: Responsible Artificial Intelligence (RAI):

Responsible Artificial Intelligence refers to the use of AI technologies in ways that ensure compliance with ethical standards such as responsibility, transparency, ethical empathy, and accountability. Responsible AI serves as a foundation to ensure that decisions made by intelligent systems do not result in discrimination or institutional errors (Floridi et al., 2018; Jobin et al., 2019).

Mediating Variable: Entrepreneurial Leadership (ELD):

Entrepreneurial Leadership is a leadership style that combines a future-oriented vision, initiative, opportunity exploitation, risk management, and motivation of work teams toward creativity. It is viewed as a critical factor in guiding the adoption of technology to enhance innovation within institutions (Gupta et al., 2004; Renko et al., 2013).

Dependent Variable: Creative Performance (INNP):

Creative Performance refers to the institution's ability to develop and implement new ideas that lead to continuous improvement of products, services, and procedures. Creative Performance is directly linked to the availability of a work environment that encourages renewal and adopts modern technologies strategically (Amabile, 1996; Baryniene & Dauknyte, 2015).

Study Hypotheses:

Based on the theoretical framework and previous studies, the study assumes the following relationships among its three variables: Responsible Artificial Intelligence (independent variable), Creative Performance (dependent variable), and Entrepreneurial Leadership (mediating variable). The hypotheses were formulated according to the conceptual model as follows:

H1: Responsible Artificial Intelligence (RAI) has a statistically significant positive effect on Entrepreneurial Leadership (ELD) in the governmental sector in the State of Qatar.

H2: Responsible Artificial Intelligence (RAI) has a statistically significant positive effect on Creative Performance (INNP) in the governmental sector of the State of Qatar.

H3: Entrepreneurial Leadership (ELD) has a statistically significant positive effect on Creative Performance (INNP) in the governmental sector in the State of Qatar.

H4: (Mediation Hypothesis) Entrepreneurial Leadership (ELD) mediates the relationship between Responsible Artificial Intelligence (RAI) and Creative Performance (INNP), thereby enhancing this relationship.

STUDY METHODOLOGY

This study falls within the category of descriptive–analytical research, as it aims to describe the current reality of adopting Responsible Artificial Intelligence within governmental institutions in the State of Qatar, and to analyze the nature of the relationship between this adoption and the level of Creative Performance, while verifying the mediating role played by Entrepreneurial Leadership in this relationship. The descriptive–analytical approach is one of the most commonly used methods in the social and administrative sciences, especially when dealing with complex administrative phenomena and identifying causal patterns among them without intervention (Creswell & Creswell, 2018).

The study adopted a quantitative methodology, which is the most appropriate approach for its objectives, which revolve around measuring the relationship between specific variables and testing statistically measurable hypotheses. Quantitative methodology is preferred in studies seeking statistical generalization to a particular population and achieving a high degree of objectivity through standardized measurement tools (Neuman, 2014).

The study relied on a quantitative survey design, which allows data collection from a group of respondents using a closed-ended questionnaire based on published, peer-reviewed scientific scales. This design is suitable for identifying leadership attitudes toward concepts such as Responsible AI, leadership styles, and innovation levels, especially in government-sector environments.

Analytically, Partial Least Squares Structural Equation Modeling (SEM) was used, which is an advanced method for analyzing causal relationships among latent variables, particularly when a mediating variable is included, as in the present study (Hair et al., 2021). This method enabled precise testing of the hypotheses and identification of direct and indirect effects between the variables.

Accordingly, the study design is based on analyzing the relationship between an independent variable (Responsible AI), a mediating variable (Entrepreneurial Leadership), and a dependent variable (Creative Performance), relying on a quantitative survey approach and advanced statistical analysis tools to provide generalizable results for governmental leaders in Qatar and contribute to developing administrative policies related to digital transformation and innovation.

Study Population

The study population comprises administrative leaders working in the government sector in the State of Qatar. This population was identified based on specific professional characteristics and is limited to individuals who hold leadership positions, have supervisory responsibilities, and are familiar with generative AI tools and their institutional applications.

This population was chosen for the vital role leaders play in guiding the use of generative AI tools and making decisions about technology applications and digital transformation, as well as their direct responsibility for enhancing the creative environment within their institutions.

The nature of this population aligns with the study objectives, which aim to analyze the relationship between the use of Responsible AI (RAI) and the level of Creative Performance (INNP), and the role of Entrepreneurial Leadership (ELD) in influencing this relationship. Leaders at this organizational level are best positioned to evaluate the impact of AI tools on the work environment and creative practices, and to assess their readiness to adopt entrepreneurial leadership orientations.

In defining the study population, care was taken to ensure that participants actively interact with generative AI tools such as ChatGPT, Copilot, and Gemini, enabling realistic assessments of their use and impact within the institution.

Study Sample

The study sample was selected using purposive sampling, a nonprobability sampling method appropriate for studies targeting individuals with specific expertise or characteristics directly related to the research topic (Etikan et al., 2016).

This method was adopted to target a leadership group within governmental institutions that has practical knowledge of generative AI tools and occupies organizational positions that enable them to evaluate the impact of such tools on performance and institutional creativity.

The sample size reached 150 participants from various ministries, authorities, and governmental institutions in Qatar. Participants were selected according to predefined criteria, ensuring that they:

- work in a governmental entity in the State of Qatar.
- occupy a leadership or supervisory position (Head of Department, Director of Administration, General Director, or higher).
- are familiar with generative AI tools (ChatGPT, Copilot, Gemini, or others).
- are proficient in Arabic.

All responses were verified to ensure compliance with these criteria before being included in the statistical analysis.

Study Instrument

The research relied on a closed-ended questionnaire as the primary data collection tool, due to its suitability for quantitative studies in administrative sciences and its ability to provide standardized, measurable, and analyzable data.

The instrument was designed to measure the three study variables: Responsible AI (independent variable), Entrepreneurial Leadership (mediating variable), and Creative Performance (dependent variable), in addition to collecting participants' demographic data.

The questionnaire consisted of four sections, all formulated using a five-point Likert scale.

The first section included demographic data related to age, gender, job level, experience, and familiarity with generative AI tools.

The Responsible AI section contained eight items across four sub-dimensions (responsibility, transparency, ethical empathy, and accountability) derived from Gupta et al. (2023) and based on Dignum's framework (2019).

The Entrepreneurial Leadership section included seven items adapted from Bagheri & Harrison (2020).

The Creative Performance section contained five items based on the scale of Mikalef & Gupta (2021).

All scales were translated and adapted to the Qatari context and reviewed by a subject-matter expert to ensure linguistic accuracy and content relevance.

The instrument received approval from Qatar University's Institutional Review Board (IRB No. 2289075-1), ensuring its validity and suitability for research use.

Validity and Reliability

The instrument's validity and reliability were verified using methodological procedures consistent with quantitative research requirements, particularly when employing SEM to analyze the data.

Validity:

Face validity and content validity were ensured to confirm that the items accurately reflect the three study variables. The questionnaire underwent careful review by the supervising professor to assess its clarity and appropriateness for the Qatari context and research objectives.

Statistical validity was verified through construct validity by analyzing the model and examining:

- Discriminant validity using the Fornell–Larcker criterion.
- Convergent validity by calculating the Average Variance Extracted, with all values exceeding the acceptable minimum of 0.50 (Hair et al., 2022).

Reliability:

Internal reliability was assessed using Composite Reliability rather than Cronbach's Alpha, given the nature of the SEM analysis, where Composite Reliability is preferred for estimating internal consistency in factor-analytic models (Hair et al., 2010).

Results showed that:

- All variables exceeded the required threshold of 0.70 in Composite Reliability.
- Reliability indicators were strong across Responsible AI, Entrepreneurial Leadership, and Creative Performance.

Thus, the statistical results support the instrument's validity and reliability, enhancing the credibility of the data and its suitability for accurately testing the study hypotheses.

Data Collection Procedures

Data collection was conducted using systematic procedures to ensure adherence to research ethics and the accuracy and reliability of information from participants.

The questionnaire was prepared electronically in Microsoft Forms to facilitate access to targeted government leaders, maximize response rates, and maintain confidentiality.

Data collection began after obtaining official ethical approval from Qatar University's Research Ethics Committee. An informed consent statement was included at the beginning of the questionnaire, explaining the nature and purpose of the study, data confidentiality, and voluntary participation.

The questionnaire link was distributed to administrative leaders in Qatari government entities through:

- Professional communication groups (such as leadership groups on work platforms).
- Professional social media platforms to ensure effective and efficient access to the target population.

Data were collected between March and June 2025. Filling out the questionnaire required an average of 5–10 minutes.

A screening process was conducted to ensure compliance with inclusion criteria and to exclude incomplete or ineligible responses.

The preliminary screening included:

- excluding individuals who did not meet the professional criteria (below Head of Department or lacking AI tool familiarity).
- ensuring no duplicate responses.

These procedures ensured high-quality and reliable data before proceeding to statistical analysis.

Statistical Analysis

Data were processed and analyzed quantitatively using Partial Least Squares Structural Equation Modeling (SEM) via AMOS version 22. This advanced statistical method allows testing relationships between latent variables, including direct and indirect effects, and is suitable for complex models and studies involving mediators (Hair et al., 2022).

This method was chosen for several reasons, including:

- suitability for medium-sized samples (100–300 participants).
- no strict assumption of normal data distribution.
- high accuracy in testing mediation and effect models.

Analytical Procedures Followed:

The study followed advanced analytical procedures to ensure the accuracy and reliability of the results.

First, demographic characteristics were analyzed to describe the sample distribution according to variables such as gender, age, position, and experience.

Tests of validity and reliability were conducted using AVE and Composite Reliability to ensure convergent validity and internal consistency, and discriminant validity was checked using the Fornell–Larcker criterion.

The structural model was analyzed by estimating path coefficients between Responsible AI, Entrepreneurial Leadership, and Creative Performance, with significance tested using Bootstrapping, and the coefficient of determination (R^2) examined to estimate explained variance.

A mediation analysis was conducted to determine the mediating role of Entrepreneurial Leadership in the relationship between Responsible AI and Creative Performance, based on p-values and indirect effects.

Ethically, the study adhered to recognized scientific standards. Approval was obtained from the Qatar University IRB (QU-IRB). Informed consent was included at the beginning of the questionnaire, clarifying participants' rights and the study's purpose. Data were collected anonymously without any identifying information and stored securely. Neutrality was maintained in item formulation and in data analysis without bias or participant incentives, reflecting adherence to scientific and professional integrity.

DATA ANALYSIS AND STUDY RESULTS

Demographic Composition of Respondents

The study sample included (150) participants from executive leadership, as well as senior and middle supervisory levels in governmental institutions in the State of Qatar, providing appropriate representation of the targeted group with direct experience in team management and decision-making. The demographic distribution showed a balance between males and females (50% each), reflecting the advancement of government policies supporting women's empowerment in leadership positions. The data also indicated that most participants were in the middle age group (30–49 years), representing more than 74%, suggesting an appropriate level of professional maturity for leadership roles.

Table 1

Table 1. Demographic Characteristics of Respondents (Sample)

Percentage (%)	Number of Participants (N = 150)	Demographic Profile
Gender		
50.0	75	Male
50.0	75	Female
100.0	150	Total
Age (Years)		
12.7	19	18–29 years
38.6	58	30–39 years
36.0	54	40–50 years
12.7	19	51 years and above
100.0	150	Total
Education Level		
3.3	5	Diploma / High School
41.3	62	Bachelor's
47.4	71	Master's
8.0	12	PhD
100.0	150	Total
Job Level		
60.7	91	Head of Department
27.3	41	Director of Administration
12.0	18	General Director or Higher
100.0	150	Total
Work Experience (Years)		
5.3	8	Less than 5 years
23.3	35	5–10 years
38.7	58	10–20 years
32.7	49	More than 20 years
100.0	150	Total
Number of Subordinates		
26.7	40	Fewer than 4
40.0	60	4–10 subordinates
33.3	50	More than 10
100.0	150	Total
AI Experience (Years)		
35.3	53	Less than 1 year
50.7	76	1–2 years
12.0	18	3–5 years
2.0	3	More than 5 years
100.0	150	Total

The academic qualifications showed that the majority of the sample held postgraduate degrees: 47.4% held a master's degree and 41.3% a bachelor's degree, reflecting a high level of education and strong knowledge-based input into the study.

At the job level, Heads of Department constituted the largest group (60.7%), followed by Directors of Administration (27.3%), and then General Directors (12%), indicating good representation of different levels of operational and strategic leadership.

Regarding professional experience, the findings revealed that most participants had 10-20 years (38.7%) or more than 20 years (32.7%), which strengthens the reliability of their views on leadership and institutional creativity.

The number of subordinates supervised by participants varied: 40% managed teams of 4–10 employees, and 33.3% supervised more than 10, indicating varied and advanced organizational responsibilities.

Regarding AI experience, the results showed relatively recent use of these technologies, with about 50.7% having 1–2 years of experience and 35.3% having less than 1 year. Only 2% had more than 5 years of experience, indicating that AI adoption in the Qatari government sector is still in its growth stage and highlighting the need to strengthen digital competencies among leaders.

Descriptive Statistics of the Study Questions

Descriptive statistics provide an important quantitative perspective on participants' perceptions of the main dimensions of the study, including Responsible Artificial Intelligence (responsibility, transparency, ethical empathy, accountability), Entrepreneurial Leadership, and Creative Performance. The means and standard deviations show the degree of participants' agreement and the level of variation in their responses, contributing to more accurate conclusions about the leadership environment in their institutions.

The study data were analyzed using descriptive statistics to measure participants' attitudes toward the leadership and behavioral dimensions associated with Creative Performance in the governmental work environment. The analysis included calculating means and standard deviations for each item to determine the level of agreement and the degree of variation among participants' views.

Table 2. Descriptive Statistics (Mean and Standard Deviation of Measurement Items)

Variable	Item	Mean	Std. Deviation
Responsible Artificial Intelligence			
Dimension: Responsibility			
	RES1	4.3133	.78695
	RES2	4.4867	.62107
	Average	4.4	0.70401
Dimension: Transparency			
	TRA1	4.4133	.67741
	TRA2	4.2533	.74353
	Average	4.3333	0.71047
Dimension: Ethical Empathy			
	ETEM1	4.3467	.77708
	ETEM2	4.4667	.68215
	Average	4.4067	0.7296
Dimension: Accountability			
	ACT1	4.0867	.85087
	ACT2	3.8533	.98571
	Average	3.97	0.91829
Entrepreneurial Leadership			
	ELD1	4.3600	.54686
	ELD2	4.4333	.56064
	ELD3	4.4200	.55888
	ELD4	4.4067	.63560
	ELD5	4.4733	.57576
	ELD6	4.2867	.70793
	ELD7	4.4333	.57249
	Average	4.4019	0.5940
Creative Performance			
	INNP1	4.1333	.77431
	INNP2	4.0067	.87083
	INNP3	4.0000	.88234
	INNP4	4.0267	.89702

	INNP5	3.9333	.94597
	Average	4.0200	0.87409

First: Responsible Artificial Intelligence

The results of Responsible AI analysis indicate that the ethical values associated with the use of AI technologies are highly evident among the participants, with some variation across dimensions. The Responsibility dimension achieved the highest levels of agreement, with the means for RES1 and RES2 at 4.31 and 4.49, respectively, reflecting a strong perception among participants of the importance of assuming responsibility in administrative contexts and of adopting practices that reinforce ethical discipline among leaders.

The Transparency dimension also scored high means (4.41 and 4.25), indicating the availability of high levels of disclosure and information flow, which enhance organizational trust and reflect institutions' commitment to the principles of good governance.

The Ethical Empathy dimension also showed strong agreement among participants (4.35 and 4.47), indicating leadership practices that consider human aspects in the workplace and foster belonging and trust within the institution.

In contrast, the Accountability dimension recorded the lowest means (4.09 and 3.85), with relatively higher standard deviations, suggesting variation in participants' perceptions of accountability or differences in its implementation across governmental institutions.

Second: Entrepreneurial Leadership

The items of Entrepreneurial Leadership (ELD1 to ELD7) showed high, relatively stable means (4.29-4.47) and low standard deviations. This reflects strong agreement among participants regarding the presence of leadership characteristics with a strategic and innovative orientation in their work environments, thereby enhancing the effectiveness of organizational change and transformation processes.

These values indicate that entrepreneurial leadership behaviors—such as decision-making, initiative, and future foresight—are practiced at a high and consistent level.

Third: Creative Performance

Creative Performance received relatively moderate evaluations compared to the other dimensions, with means ranging between 3.93 and 4.13 and relatively high standard deviations (exceeding 0.87 in some items). This indicates variation in the extent to which creative behaviors are perceived or practiced, which may reflect organizational or environmental challenges affecting institutional innovation.

Overall, participants' perceptions of several leadership dimensions are positive, particularly Responsibility, Entrepreneurial Leadership, and Ethical Empathy.

Variations in standard deviation indicate relative differences in individuals' experiences across the organizational environment, especially in the Accountability and Creativity dimensions, raising more profound questions about the extent of alignment between leadership and motivational/creative practices in governmental institutions.

This also justifies the need to strengthen motivational and accountability practices within leadership development programs.

Analysis of Construct Reliability, Validity, and Discriminant Validity

Composite Reliability, Convergent Validity, and Discriminant Validity:

Evaluating construct reliability and validity is an essential step to ensure that the measurement model is statistically and theoretically appropriate. This evaluation includes Composite Reliability (CR), Average Variance Extracted (AVE), and testing Discriminant Validity between the three dimensions: Entrepreneurial Leadership (ELD), Responsible Artificial Intelligence (RAI), and Creative Performance (INNP), using the Fornell–Larcker criterion. Table 3 presents construct reliability and discriminant validity as follows:

Table 3. Construct Reliability and Discriminant Validity

Variable	CR	AVE	ELD	RAI	INNP
Entrepreneurial Leadership (ELD)	0.899	0.561	0.749		
Responsible AI (RAI)	0.901	0.696	0.692	0.835	
Creative Performance (INNP)	0.927	0.719	0.347	0.234	0.848

First: Composite Reliability (CR)

The high values of Composite Reliability indicate that all dimensions demonstrate strong internal consistency:

- Entrepreneurial Leadership (ELD): CR = 0.899
- Responsible Artificial Intelligence (RAI): CR = 0.901
- Creative Performance (INNP): CR = 0.927

All values exceed the acceptable minimum threshold (0.70), indicating strong internal consistency among the items forming each dimension.

Second: Average Variance Extracted (AVE)

The AVE values for all constructs exceeded the acceptable minimum (0.50), reflecting a good level of convergent validity, and indicating that the items explain a substantial proportion of the variance in each construct:

- ELD = 0.561
- RAI = 0.696
- INNP = 0.719

These results strongly indicate the quality of the measurement model and its ability to capture the intended constructs, reinforcing the model's convergent validity.

Third: Discriminant Validity

Discriminant validity was assessed using the Fornell–Larcker criterion, which requires the square root of the AVE for each construct (shown diagonally) to be greater than its correlations with other constructs (non-diagonal values).

This condition was met for all three constructs:

- Entrepreneurial Leadership (ELD): √AVE = 0.749
  Higher than correlations with RAI (0.692) and INNP (0.347).
- Responsible AI (RAI): √AVE = 0.835
  Higher than correlations with ELD (0.692) and INNP (0.234).
- Creative Performance (INNP): √AVE = 0.848
  Higher than correlations with ELD (0.347) and RAI (0.234).

These results indicate that each construct is distinct and does not overlap in an undesirable way with the others, confirming discriminant validity and providing a solid statistical foundation for analyzing causal relationships in later stages.

The findings indicate high structural reliability and theoretical validity for the three study constructs. The conceptual structures of Entrepreneurial Leadership, Responsible AI, and Creative Performance demonstrated strong internal consistency and apparent convergent and discriminant validity, supporting their use for structural modeling and the interpretation of leadership behavior within the context of digital transformation and institutional innovation.

Standardized Regression Weights (Factor Loadings):

Standardized regression weights (Factor Loadings) provide a precise indication of the extent to which each observed variable represents the latent construct it measures. In Structural Equation Modeling (SEM), loadings above 0.70 are considered strong, while values above 0.60 are acceptable for complex behavioral constructs. This is shown in Table 4 and Figure 2.

Table 4. Standardized Regression Weights (Factor Loadings)

Construct	Item	→	Factor	Estimate
Entrepreneurial Leadership	ELD1 → ELD	0.745		
	ELD2 → ELD	0.712		
	ELD3 → ELD	0.784		
	ELD4 → ELD	0.794		
	ELD5 → ELD	0.73		
	ELD6 → ELD	0.725		
	ELD7 → ELD	0.748		
Creative Performance	INNP1 → INNP	0.739		
	INNP2 → INNP	0.882		
	INNP3 → INNP	0.925		
	INNP4 → INNP	0.851		
	INNP5 → INNP	0.83		
Accountability	ACT2 → ACT	0.784		
	ACT1 → ACT	0.902		

Responsibility	RES1 → RES	0.691		
	RES2 → RES	0.631		
Ethical Empathy	ETEM1 → ETEM	0.754		
	ETEM2 → ETEM	0.845		
Transparency	TRA1 → TRA	0.733		
	TRA2 → TRA	0.746		

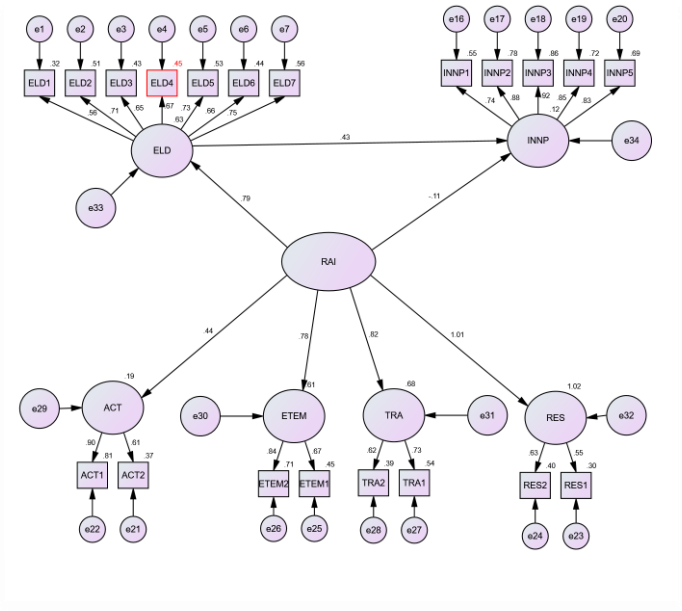

Figure 2. Factor Loadings

Responsible Artificial Intelligence (RAI):

The conceptual structure of Responsible Artificial Intelligence showed strong representation through four primary indicators:

- RES (Responsibility): 0.941
- TRA (Transparency): 0.822
- ACT (Accountability): 0.784
- ETEM (Ethical Empathy): 0.781

These high values indicate strong convergent validity, particularly because the highest loading occurred for the Responsibility indicator (RES), reflecting the perceived importance of this dimension in participants' awareness of AI in their organizational environments.

Entrepreneurial Leadership (ELD):

This construct consisted of seven indicators with factor loadings ranging between 0.712 and 0.794, all within the statistically acceptable range, where:

• **ELD4 (0.794)** and **ELD3 (0.784)** recorded the highest values, indicating that these items represent entrepreneurial practices such as innovation and proactiveness.

• The lowest loading was **ELD2 (0.712)**, but it remains within acceptable limits, reflecting good internal consistency.

These results highlight that the Entrepreneurial Leadership construct has been measured accurately, with balanced representation of the behavioral elements characterizing this leadership style.

Innovative Performance (INNP):

This dimension recorded very high loadings, reflecting strong structural representation:
• INNP3 (0.925) and INNP2 (0.882) are among the highest values in the entire model, indicating that actual innovative performance was clearly present in participants' perceptions.
• Other indicators, such as INNP4 (0.851) and INNP5 (0.830), also show strong consistency supporting the reliability of this dimension.

These results suggest that the five items measuring Innovative Performance represent the underlying construct with high clarity and precision, strengthening the confidence in using this dimension in interpretation and analysis.

These findings indicate that all study constructs strongly and consistently represent their theoretical frameworks, as evidenced by standardized regression weights exceeding 0.70 in most cases and apparent convergent validity across variables. These indicators confirm the quality of the measurement tools used, enhancing confidence in the final structural model results and enabling the constructs to be used reliably for causal interpretation and theoretical analysis.

Hypothesis Testing Analysis

Hypothesis testing within the Structural Equation Model (SEM), as shown in Table 5, presents the causal relationships among the three latent variables: Responsible Artificial Intelligence (RAI), Entrepreneurial Leadership (ELD), and Innovative Performance (INNP).

The significance of these relationships was evaluated based on the Estimate coefficient, Standard Error (S.E.), Critical Ratio (C.R.), and Statistical Significance (P-value).

Table 5. Hypothesis Testing

Relationship	Estimate	S.E.	C.R.	P	Label
ELD <--- RAI	.792	.334	2.761	.006	par_18
INNP <--- RAI	-.109	.445	-.526	.599	par_19
INNP <--- ELD	.433	.376	2.136	.033	par_20

1. First Hypothesis: Effect of Responsible AI on Entrepreneurial Leadership (RAI → ELD)

Estimate = 0.792, C.R. = 2.761, P = 0.006

The results indicate a statistically significant positive relationship between Responsible AI and Entrepreneurial Leadership, as the significance level is below 0.05. This path shows that adopting AI behaviors grounded in responsibility, transparency, and ethics significantly contributes to shaping a leadership style characterized by proactiveness and innovation.

This relationship underscores the importance of ethical frameworks in enhancing digital leadership capable of responding to institutional change and transformation.

Result: Hypothesis Supported Statistically.

2. Second Hypothesis: Effect of Responsible AI on Innovative Performance (RAI → INNP)

Estimate = -0.109, C.R. = -0.526, P = 0.599

The results show that the relationship between Responsible AI and Innovative Performance is not statistically significant, as the P-value exceeds the acceptable threshold (0.05). This means there is no clear, direct effect of this variable on innovative behavior within the sample studied.

Result: Hypothesis Not Supported Statistically.

3. Third Hypothesis: Effect of Entrepreneurial Leadership on Innovative Performance (ELD → INNP)

Estimate = 0.433, C.R. = 2.136, P = 0.033

The results indicate a significant positive effect of Entrepreneurial Leadership on Innovative Performance, with a significance level below 0.05. This supports the hypothesis that leaders who adopt an entrepreneurial style tend to motivate their teams toward innovation and experimentation, contributing to a workplace environment oriented toward creative thinking and continuous development.

This approach is essential for enhancing institutional responsiveness to dynamic changes in the modern organizational landscape.

Result: Hypothesis supported statistically.

The results support the relationships between Responsible AI and Entrepreneurial Leadership, and between Entrepreneurial Leadership and Innovative Performance.

In contrast, Responsible AI showed no statistically significant direct effect on Innovative Performance, suggesting a likely indirect effect through Entrepreneurial Leadership as a mediating variable.

This calls for conducting a mediation analysis to accurately explore this pathway.

This model aligns with leadership literature and highlights the importance of designing institutional policies that integrate ethical technology use with empowerment to enhance innovation and organizational creativity.

Mediating Effect Test Results:

A mediation test was conducted to determine whether Entrepreneurial Leadership (ELD) mediates the relationship between Responsible AI (RAI) and Innovative Performance (INNP). The mediation pathway was evaluated using standardized estimates, standard error, T-value, and statistical significance (P-value), as shown in Table 6.

Table 6. Mediation Test

Relationship	Standard beta	Standard error	T-value	P-value
RAI–ELD–INNP	0.27	0.047	5.744	0.000

The table shows a statistically significant mediation, confirming the indirect effect of Responsible AI on creativity through Entrepreneurial Leadership, where: **RAI → ELD → INNP**

- Indirect standardized effect (Standardized Beta): **0.27**
- Standard Error: **0.047**
- T-value: **5.744**
- P-value: **0.000**

These results indicate that the indirect relationship between Responsible AI and Innovative Performance through Entrepreneurial Leadership is statistically significant at the level ($p < 0.001$). This represents a moderate effect with strong significance, reflecting the strength of the mediating effect and reinforcing the mediation hypothesis.

The results show that Responsible AI does not exert a direct effect on Innovative Performance (as demonstrated by the direct testing). However, it does so indirectly by strengthening entrepreneurial leadership styles. This indicates that institutions adopting responsible AI practices create an enabling environment for leaders, enabling them to adopt entrepreneurial leadership approaches that, in turn, motivate employees to perform creatively.

The results confirm complete mediation: the direct relationship between RAI and INNP was not significant, whereas the indirect relationship through ELD was highly significant.

This model supports the importance of enabling Entrepreneurial Leadership as a strategic pathway to maximize the impact of Responsible AI on institutional innovation.

This pathway highlights that using AI in the workplace in a responsible, ethical, and transparent manner strengthens entrepreneurial leadership styles, which, in turn, stimulate creative performance behaviors among employees. This supports the full mediation hypothesis, indicating that AI does not influence creativity directly, but operates through leaders who adopt entrepreneurial approaches, encouraging innovation and organizational experimentation.

ANALYSIS OF DATA AND STUDY RESULTS

Discussion of the Study Hypotheses

After analyzing the data using the Structural Equation Model (SEM) in AMOS 22, the four hypotheses that form the study's theoretical model—linking Responsible AI, Entrepreneurial Leadership, and Innovative Performance—were tested.

This section discusses each hypothesis individually by connecting the quantitative findings to the theoretical context on which the model was built, and by comparing the findings with previous literature, both Arabic and international.

Discussion of Hypothesis 1 (H1):

There is a statistically significant positive effect between Responsible AI (RAI) and Entrepreneurial Leadership (ELD).

Discussion of the first hypothesis shows that the results confirm a statistically significant positive relationship between Responsible AI and Entrepreneurial Leadership. This confirms the hypothesis and reflects the essential role that ethical and technical principles of Responsible AI play in supporting entrepreneurial leadership practices within governmental institutions.

The results show that adopting principles such as transparency, accountability, and ethical empathy enhances decision quality and increases leaders' trust in technology, giving them greater space for initiative and innovation—consistent with Dignum (2019) and the findings of Al-Qahtani (2021) regarding the role of digital governance in fostering leadership initiative.

Further evidence suggests that leaders with an entrepreneurial orientation are more willing to adopt technology when it aligns with institutional values, consistent with Gupta et al. (2023). The findings also align with Bagheri & Harrison (2020) and Renko et al. (2013), who emphasized that a responsible digital environment enhances courage, proactiveness, and the ability to lead change.

Thus, Responsible AI serves not only as a technical enabler but also as an institutional factor that strengthens entrepreneurial behavior and reinforces leadership roles in government work environments.

Discussion of Hypothesis 2 (H2):

There is a statistically significant positive effect between Responsible AI (RAI) and Innovative Performance (INNP) in the Qatari governmental sector.

Testing the second hypothesis showed no significant direct effect between Responsible AI and Innovative Performance in the Qatari governmental sector, leading to its rejection.

This reveals that adopting Responsible AI practices—despite encompassing transparency, accountability, and ethical empathy—does not automatically translate into institutional creativity without leadership activation and a supportive organizational environment.

The findings indicate that the technical role of Responsible AI alone is insufficient to generate creative outputs, especially in the governmental context characterized by hierarchical structures, bureaucratic procedures, and limited flexibility required for innovation. Additionally, a weak organizational culture supporting creativity may hinder the effect.

Responses from Qatari leaders further indicated that creativity is viewed as a product of human leadership rather than a direct effect of technology, reflecting a cultural and administrative reality where AI's impact depends heavily on leadership activation.

This result aligns with Arab studies such as Al-Nafrawi (2024) and Mikalef & Gupta (2021), which confirmed that AI does not drive creativity without leadership empowerment and a supportive climate—although it differs from other studies (e.g., Almheiri et al., 2025; Holzner et al., 2025) that found a direct effect in other contexts.

Thus, the study reveals the uniqueness of the Qatari context and confirms that Responsible AI serves as an enabling condition rather than a direct driver of creativity in the absence of effective leadership.

Discussion of Hypothesis 3 (H3):

There is a statistically significant positive effect between Entrepreneurial Leadership (ELD) and Innovative Performance (INNP) in governmental institutions.

Discussion of the third hypothesis shows that Entrepreneurial Leadership is one of the most influential factors in enhancing Innovative Performance within governmental institutions. Statistical analysis confirmed a strong and significant direct relationship, supporting the hypothesis.

This link is explained by the fact that entrepreneurial leaders create an environment conducive to innovation by adopting strategic vision, empowering teams, encouraging initiative, and promoting calculated risk-taking—core conditions for organizational creativity, as stated by Renko et al. (2013).

The results further show that Entrepreneurial Leadership can overcome bureaucratic rigidity by promoting effective delegation, supporting decision-making, and opening space for new ideas—consistent with Bagheri & Harrison (2020).

The study also aligns with Amabile's (1996) model emphasizing the critical role of leadership climate in enabling individuals to generate creative ideas, as well as the findings of Mumford & Licuanan (2004), which linked creative leadership with knowledge structuring to produce innovative solutions.

Thus, the results confirm the central role of Entrepreneurial Leadership in transforming organizational potential and human resources into actual innovative performance, supporting contemporary perspectives that redefine the role of government leaders from traditional supervisors to strategic innovation facilitators.

Discussion of Hypothesis 4 (H4):

Entrepreneurial Leadership (ELD) mediates the relationship between Responsible AI (RAI) and Innovative Performance (INNP) in governmental institutions in Qatar.

The discussion of the fourth hypothesis shows that Entrepreneurial Leadership serves as a full mediator in the relationship between Responsible AI and Innovative Performance. Mediation analysis in AMOS 22 demonstrated that Responsible AI has no direct effect on Innovative Performance; its effect becomes significant only when activated by Entrepreneurial Leadership.

This result confirms that technology—even when governed by principles of responsibility and transparency—does not translate into creative value unless interpreted and transformed through a leader capable of reconfiguring it, building a supportive culture, and guiding the team to use these tools as enablers rather than threats.

This aligns with Mikalef & Gupta (2021) and Gupta et al. (2023), who stressed the importance of the leadership dimension in activating the institutional value of modern technologies. It also reinforces the views of Renko et al. (2013) and Bagheri & Harrison (2020), who described entrepreneurial leadership as the bridge connecting technology inputs to innovation outputs.

Thus, the study provides strong support for the theoretical model suggesting that the relationship between Responsible AI and creativity is not direct but conditioned by entrepreneurial leadership, which transforms technological potential into tangible creative outcomes within governmental institutions.

Interpretation of Results in Light of Theory and Previous Studies

The results, when interpreted through theoretical frameworks and previous studies, reveal that the relationship between Responsible AI and institutional innovation is not direct but complex, depending on the leadership and organizational context within governmental institutions.

The data showed that Responsible AI does not directly affect Innovative Performance—contrary to some global findings—reflecting the uniqueness of the Qatari context where leadership rather than technology is viewed as the decisive element in activating innovation potential.

Hypotheses H1 and H3 indicate that Responsible AI enhances entrepreneurial leadership behavior, and entrepreneurial leadership, in turn, is a strong direct driver of organizational creativity—aligned with literature emphasizing the critical role of leaders in leveraging technology for innovation.

The key result—full mediation—confirms that technology becomes creative only when reinterpreted by leaders who possess vision, empowerment, and the capacity to foster a culture that encourages experimentation.

Thus, the study presents a new explanatory model showing that governmental digital transformation is not achieved merely by adopting AI tools but requires conscious leadership that integrates technology into an ethical and organizational ecosystem that supports innovation. This makes creativity in the Qatari context a leadership-driven outcome rather than a purely technological one.

Theoretical Contribution of the Study

The theoretical contribution lies in being one of the first scientific attempts to test the integrated relationship between Responsible AI, Entrepreneurial Leadership, and Innovative Performance within the Qatari governmental sector. This adds a new dimension to Arab and Gulf literature in public administration and digital transformation.

The study introduced Responsible AI as an ethical construct within organizational performance models, building on Dignum (2019) and Gupta et al. (2023), and emphasizing the need to integrate ethical principles into analyses of AI effects.

It also offered a different perspective on Entrepreneurial Leadership, treating it as a mediating factor that activates the relationship between technology and creativity, in line with Renko et al.'s (2013) call to highlight leadership's role in leveraging technology.

Additionally, the study makes an intellectual contribution by integrating the three variables into a single explanatory model not previously formulated in this way, addressing the need highlighted by Mikalef & Gupta (2021) for multidimensional models of institutional innovation.

Furthermore, the study tested this model in an Arab governmental context (Qatar), thereby expanding theoretical frameworks into non-Western settings that require greater contextual grounding, as Al-Nafrawi (2024) indicated.

Finally, it contributed to advancing adapted and validated measurement tools based on international scales such as Dignum (2019), Bagheri & Harrison (2020), and Mikalef & Gupta (2021), providing a scientific foundation for future Arab research.

Practical and Administrative Implications of the Study

The practical and administrative implications of this study yield actionable insights that can support the development of institutional performance in the Qatari governmental sector. The findings indicate that Responsible AI does not generate creative impact unless activated by leadership capable of directing its use in accordance with principles of transparency and accountability. This necessitates redefining the role of AI within governmental agencies—not as a standalone technical tool, but as an embedded element within a broader leadership system.

The study also highlights the importance of investing in the development of Entrepreneurial Leadership as the mediator that transforms technological potential into creative outcomes. This requires leadership programs that enhance strategic thinking, change management, and motivation skills.

The results recommend designing governance frameworks to regulate the ethical use of AI based on the principles outlined by Dignum (2019), while creating a flexible organizational environment that encourages experimentation and initiative and integrates technologies in ways that stimulate creativity.

The study emphasizes that digital transformation should be viewed as a leadership and cultural transformation linked to institutional performance—not merely a technical upgrade—in line with Mikalef & Gupta's (2021) suggestion.

In light of Qatar National Vision 2030, the study's findings help guide decision-makers toward integrating AI into a leadership structure that supports innovation, thereby enhancing the effectiveness and sustainability of governmental services.

The Social Impact of AI and the Importance of Leadership in Guiding It

Generative AI represents one of the most transformative technologies shaping the nature of government work—not only administratively and technically, but also in its social impact within the workplace. Although the current study did not include questionnaire items that directly measure social impact or technological replacement anxiety, this dimension is among the most prominent topics in the AI-related literature in the public sector.

Studies such as Dignum (2019) and Papagiannidis et al. (2025) indicate that the adoption of AI technologies may generate anxiety among employees about the loss of control or job displacement, especially in bureaucratic environments. According to Dignum (2019), transitioning to intelligent systems without clear role definitions may create a sense of job insecurity and weaken trust in technology.

From this standpoint, Entrepreneurial Leadership emerges as a key factor in mitigating these concerns. The current study highlighted that Entrepreneurial Leadership acts as a social safety valve within the institution, directing AI tools toward enhancing creative performance rather than threatening human competencies. Leaders with strategic vision and motivational skills can transform technology into an opportunity for development rather than a threat to job continuity by involving employees in using AI as a tool for decision support and innovation, rather than as a replacement.

This context highlights that, despite its technological power, AI requires conscious human leadership to determine *how* and *for what purpose* these tools are used. AI does not inherently create social impact; instead, leadership orientations determine whether these tools support institutional creativity or cultivate fear of job loss.

STUDY LIMITATIONS

This study is subject to several limitations that should be considered when interpreting the results. Methodologically, it relied solely on a quantitative survey, omitting qualitative methods that could provide deeper insights into leadership and organizational context. Geographically, it was limited to governmental entities within the State of Qatar, which restricts the generalizability of the results to other sectors or countries with different organizational structures.

Additionally, the sample included only supervisory leaders with knowledge of generative AI tools, limiting the findings to this group and not to other employees. The analysis is also influenced by the conceptual and technical boundaries of Responsible AI—still an evolving academic concept—where interpretations and applications may vary across institutions, affecting the precision and conceptual homogeneity of responses.

RECOMMENDATIONS

Based on the study's findings, a set of recommendations emerges for decision-makers and researchers to enhance the use of Responsible AI, support Entrepreneurial Leadership, and stimulate institutional creativity in the government sector.

On the practical level, the study recommends strengthening entrepreneurial leadership capabilities through specialized training programs focused on developing strategic thinking, change management, and motivational skills—given their essential role in activating the impact of Responsible AI on creative performance.

It also emphasizes the need to develop clear governance frameworks for AI use, grounded in transparency, accountability, algorithmic fairness, and privacy protection, as essential components for enhancing trust in intelligent applications within governmental institutions.

The study further recommends integrating AI tools into creative decision-making processes in a complementary manner to the human element, allowing institutions to leverage analytical and predictive capabilities without diminishing leadership roles. It also stresses the importance of creating an organizational environment that encourages innovation through revising internal policies, adopting a culture that permits experimentation and values initiative, and linking rewards to creative performance.

Additionally, the study calls for incorporating social and psychological dimensions into digital transformation programs to reduce anxiety associated with technological adoption and enhance employee trust in these transitions.

For future research directions, the study proposes adopting mixed-method designs that combine quantitative and qualitative approaches to gain deeper understanding of behavioral and organizational interactions related to leadership and AI use. Comparative studies across sectors and countries are also encouraged to test the model's generalizability, with the possibility of integrating moderating or mediating variables, such as organizational culture or digital transformation maturity, to provide more comprehensive explanations.

Finally, the study recommends conducting longitudinal studies to track the evolution of relationships between variables over time, given the rapid advancement of AI technologies and their growing applications in the governmental sector.

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