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Transforming public relations into a driver of commercial growth: Data-driven strategies and return on investment evaluation in the ERA of artificial intelligence

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Abstract

This study aims to redefine the role of public relations (PR) in the digital era by integrating artificial intelligence (AI) technologies, transforming it from a traditional communicative function into a strategic, data-driven system that drives measurable institutional growth. A mixed-methods design was adopted, combining quantitative and qualitative approaches. Data were collected through surveys and interviews within Arab institutional contexts and analyzed using advanced statistical tools, including SPSS, NVivo, and Natural Language Processing (NLP). Regression analysis, ANOVA, and Exploratory Factor Analysis (EFA) were conducted to validate the proposed model and test the research hypotheses. The findings reveal that practical AI usage is the strongest determinant of institutional return (B = 0.695), followed by a positive perception (B = 0.240); however, theoretical knowledge alone shows a negative association with return (B = -0.283). The results also highlight the influence of demographic variables, with males demonstrating higher levels of practical usage and females showing more positive perceptions. Institutional data quality, however, moderated the relationship between AI usage and return on investment. Overall, the study concludes that the real value of AI in PR lies in its conversion into measurable applications rather than remaining at the level of theoretical awareness. By developing an integrative model that links PR, AI, and commercial growth, and introducing performance indicators that extend beyond traditional metrics such as follower counts or media coverage, the study provides a practical roadmap for Arab institutions to adopt localized models aligned with cultural and organizational specificities, thereby supporting digital transformation and sustainable growth.

Keywords: Arab organizational culture, Artificial intelligence (AI), Corporate communication, Digital transformation, Institutional growth, Intelligent public relations, Predictive models, Return on communication intelligence (ROCI).

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1. Introduction

The function of public relations (PR) has undergone a profound transformation in the digital era, transcending its traditional conception as a mere media or promotional tool to assume a vital strategic position at the core of institutional growth frameworks. PR is no longer confined to image management or reputation building; instead, propelled by rapid technological advancements, it has evolved into an intelligent platform capable of generating insightful ideas and analytical perspectives, driving innovation, and facilitating data-driven decision-making. Among the most significant of these transformations is the deployment of artificial intelligence (AI) as an enabling factor that reshapes the concept of organizational communication through its superior capabilities in sentiment analysis, audience behavior prediction, and real-time, precisely timed message customization.

Recent studies have shown that organizations that integrate AI into their public relations strategies achieve superior outcomes, including enhanced engagement, improved campaign effectiveness, and increased return on investment in communication [1].

In contrast, the domain of public relations remains notably under-researched and under-applied in many Arab contexts, where PR is often managed through traditional approaches, and there is a lack of comprehensive conceptual models linking communicative performance with measurable commercial outcomes.

Against this backdrop, this study aims to develop an integrated conceptual and practical model that redefines public relations as a driver of commercial growth in the era of AI. Employing a mixed-methods approach that combines quantitative and qualitative analyses with advanced statistical tools, such as SPSS, NVivo, and natural language processing (NLP), the research explores how data-driven PR strategies can directly contribute to measurable institutional growth through both financial and non-financial indicators. Accordingly, the study offers a substantial theoretical contribution and serves as a practical guide enabling organizations to assess and maximize the actual value of their investments in intelligent communication.

1.1. Research Problem

Contemporary organizations face a fundamental challenge manifested in the structural contradiction between the transformative potential of artificial intelligence (AI) in the domain of public relations (PR) and the limited practical application of these technologies, especially within Arab institutional contexts. Recent literature suggests that this gap extends beyond a mere technological lag to represent a profound cognitive and perceptual challenge in understanding the strategic role of PR in the digital economy era [2, 3].

Institutional leadership in many Arab environments continues to suffer from a degree of strategic myopia regarding the so-called analytical and predictive value of AI-supported public relations, limiting their roles to tactical functions such as crisis management or corporate promotion, without recognizing their capacity to generate strategic insights that contribute to shaping strategic decisions and guiding institutional growth trajectories.

Furthermore, organizations lack advanced methodological principles and guidelines to measure the strategic value of public relations, relying instead on superficial traditional metrics (Vanity Metrics) such as follower counts or media coverage, without adopting advanced indicators like the Predictive Impact Coefficient, the Analytical Value Added Index, or the Return on Communication Intelligence (ROCI). This shortcoming overlooks some of the Barcelona Principles, which advocate for moving beyond superficial outputs toward methods grounded in real outcomes [4].

Additionally, "technological silos" are evident within institutions, where AI systems operate in isolation from organizational communication strategies, thereby impeding the necessary synergistic integration between AI's analytical capabilities and PR communicative functions [5].

Moreover, Arab institutional environments suffer from a "knowledge localization gap," reflected in the scarcity of locally adapted conceptual and applied models that consider the cultural and organizational specificities of the Arab context. This makes the importation of Western models without adaptation a risky and often ineffective endeavor [6].

1.2. Research Problem Statement

Based on the above, the central research problem can be formulated as follows:

"How can an advanced integrative model be developed to restructure public relations from a traditional communicative function into a data-driven intelligent platform capable of generating measurable strategic value and achieving sustainable institutional growth, while considering the challenges and opportunities specific to the Arab institutional context?"

This study is based on the central hypothesis that if public relations is redefined as an intelligent system grounded in AI and predictive analytics, it can transform into an effective driver of measurable institutional growth.

The research aims to construct an integrated theoretical framework that blends strategic communication theories, AI theories, and institutional value theories, thereby offering a transdisciplinary approach that transcends conventional separations between academic fields.

The study also makes a substantive contribution to the scientific literature through an in-depth empirical investigation focused on the Arab context, enriching academic discourse on the cultural and operational localization specifics of employing AI in organizational communication.

Additionally, the research develops an advanced matrix of quantitative and qualitative performance indicators to measure the effectiveness of intelligent public relations, exceeding traditional superficial indicators. It is directly linked to measurable outcomes of institutional growth.

The study also presents a strategic roadmap that enables institutions to convert the PR function into a sustainable competitive advantage by efficiently integrating AI technologies.

It also enhances decision-makers' capabilities to make data-driven and analytics-based predictions, improving decision quality and reducing institutional risks.

In parallel, the research contributes to capacity development by providing training and a practical model for specialized PR personnel, enhancing the adoption of intelligent communication practices.

On a broader scale, this study supports the Sustainable Development Goals by enhancing stakeholder communication efficiency and fostering long-term, mutually beneficial relationships. It also serves as a qualitative contributor to national digital transformation efforts by offering flexible and locally adaptable applied models across various vital sectors.

1.3. Research Objectives

This research aims to:

Develop an advanced integrative model that redefines public relations as a data-driven, intelligent platform capable of achieving measurable institutional growth in the era of artificial intelligence.

Analyze the structural transformations in the public relations function resulting from the integration of AI techniques, with an in-depth analysis of the accompanying organizational and technological dynamics.

Provide a comprehensive mapping of innovative technologies and tools applied in public relations, alongside a critical evaluation of their effectiveness and contextual suitability across different institutional environments.

Build an advanced matrix of strategic performance indicators that link communicative activities to measurable commercial outcomes.

Design an integrated methodological framework for evaluating the return on investment in communication intelligence (ROCI).

Test the causal relationships among the proposed model variables through a comprehensive empirical study across diverse institutional settings.

Verify the predictive validity of the developed model in forecasting institutional growth levels based on communication intelligence indicators.

Develop a strategic implementation guide to direct institutions on their journey toward smart public relations.

Develop a matrix of strategic recommendations tailored to different institutional contexts.

1.4. Research Questions

1.4.1. Main Question

How do AI technologies reshape the functional and strategic structure of public relations, and what are the optimal mechanisms and models to transform it into an effective driver of sustainable institutional growth within the Arab context?

1.4.2. Sub-Questions

RQ1: What are the structural and functional characteristics of the paradigmatic shift induced by AI technologies in contemporary public relations practices?

RQ2: What are the prevailing patterns and models in employing AI within public relations strategies in leading institutions at the global and regional levels?

RQ3: How do organizational, cultural, and technological variables influence the effectiveness of AI integration into public relations strategies?

RQ4: To what extent are existing analytical models and tools effective in measuring the strategic value of AI-supported public relations?

RQ5: What are the main strengths and weaknesses in current applied models of smart public relations within the Arab institutional context?

1.5. Research Hypotheses

H_1: There is a statistically significant positive relationship ($p < 0.001$) between the sophistication level of data-driven PR strategies and composite institutional growth indicators, where these strategies explain at least 35% of the variance in institutional growth rates.

H_2: The employment of advanced AI tools in public relations enhances the accuracy of communication return on investment measurement by no less than 40% compared to traditional methods, achieving a statistical confidence level exceeding 95%.

H_3: Public relations strategies integrated with advanced predictive analytics outperform traditional intuition- and experience-based strategies in achieving institutional growth by a factor ranging between 2.5 and 3.5.

H_4: The strength of the relationship between AI utilization and commercial outcomes depends on the quality of data available within the institution.

H_5: The impact of AI-supported public relations on institutional growth varies by industrial sector and organizational size, with large institutions in high-tech sectors realizing the highest benefit rates.

2. Theoretical Framework and Literature Review

2.1. Theoretical Framework

2.1.1. Transformation of Public Relations

From Traditional Communication Model to AI-Driven Strategic Model

Public relations has undergone a radical transformation from a tactical communication function focused on managing institutional image to an integrated strategic system that contributes to decision-making and value creation within organizations. This transformation is based on the Advanced Stakeholder Theory, developed by Freeman and updated in light of technological advancements, which emphasizes that public relations forms a strategic bridge between the organization and a complex network of stakeholders in a rapidly changing digital environment [7].

The Data-Driven Interactive Communication Theory supports this trend, viewing public relations as a dynamic system reliant on continuous analysis of stakeholder behaviors and preferences to improve communication processes and decision-making Johnson and Martinez [8]. Mahmud, et al. [2] demonstrated that integrating AI in public relations shifts the approach from reactive to proactive, enabling organizations to predict trends and respond before they fully materialize [2].

2.1.2. Commercial Growth in the Era of Economic Intelligence

Understanding contemporary commercial growth requires moving beyond traditional financial metrics to a multidimensional model that integrates financial performance with societal value, technological innovation, and sustainability. The Enhanced Shared Value Theory provides a conceptual framework that explains how AI-driven public relations can create shared value for organizations and stakeholders by enhancing interaction quality and increasing transparency [9].

The Complex Adaptive Systems Theory emphasizes that sustaining commercial growth requires enhancing organizational capacity and effectiveness to adapt to environmental changes by adopting intelligent communication systems that can learn and evolve. In this context, Choi and Lee [10] showed that the interactive value generated by AI communication systems positively impacts customer loyalty and retention indicators by up to 34% [10].

2.1.3. Artificial Intelligence as a Transformational Enabler in Institutional Communication Systems

AI acts as a Transformational Enabler, restructuring communication processes from operational to strategic levels. This vision is grounded in the Organizational Technology Transformation Theory, which asserts that adopting advanced technologies not only improves efficiency but also redefines the nature of work and institutional relationships [11].

2.1.4. AI Enables Organizations to Achieve Communication Integration Through

a) Advanced Predictive Analytics: Using sophisticated learning algorithms to analyze audience behavior patterns and predict future trends with up to 87% accuracy [12].

b) Dynamic Content Personalization: Employing Large Language Models to produce customized content that adapts to the cultural and linguistic context of each audience segment [13].

c) Real-time Interactive Response: Developing intelligent systems capable of monitoring sentiments and trends across social media platforms and responding instantly [14].

Yassen confirmed that relying on AI in public relations fundamentally redefines the human-machine relationship in the production and distribution of communication content [15].

2.1.5. AI-Driven Organizational Decision-Making and Intelligent Analysis Model

The AI-Driven Organizational Decision Theory is based on the principle that institutional decision-making effectiveness depends on high-quality data and the ability of intelligent systems to analyze, interpret, and translate data into actionable insights. Public relations plays a crucial role in collecting and analyzing data on stakeholder behavior and attitudes [16].

AI-powered public relations improves decision-making through:

- Effectiveness Evaluation Based on Quantitative Metrics: Utilizing advanced measures to assess campaign impacts on institutional performance indicators (ROI, Brand Equity, Customer Lifetime Value).
- Predictive Scenario Modeling: Developing mathematical models to estimate strategic decision effects on institutional image and commercial performance.
- Continuous Strategy Improvement: Applying machine learning principles to refine communication strategies based on outcomes and feedback.

Varatharaj noted that organizations using data-driven decision models in public relations achieved a 42% improvement in operational efficiency and a 56% increase in audience engagement [17].

Triple Integrative Model: Public Relations + Artificial Intelligence + Commercial Growth

This research proposes an integrated conceptual model based on the Triple Strategic Integration Theory, linking three core dimensions:

First Dimension: Public Relations as an Intelligent Interactive System

A dynamic platform combining analysis, production, distribution, and evaluation.

Adaptability to environmental and cultural changes.

Integration with other institutional systems (marketing, human resources, research and development).

Second Dimension: AI as a Cognitive Engine

Predictive analytics and sentiment analysis systems.

Personalization and recommendation algorithms.

Tools for linguistic and cultural analysis.

Third Dimension: Commercial Growth as an Integrated Outcome

Financial and operational performance indicators.

Brand value and loyalty levels.
Sustainability and social responsibility.

This model embodies the Complex Dynamic Value Theory developed by Schmidt and Liu [18] which posits that institutional value in the digital age arises from the intelligent interaction between advanced technology, specialized human resources, and flexible organizational systems.

2.2. Literature Review

This critical review aims to analyze recent developments at the intersection of public relations, artificial intelligence, and commercial growth by examining key studies that address this topic.

2.2.1. Strategic Transformation of Public Relations in the Age of Artificial Intelligence

- Redefining the Function and Institutional Role
  A pivotal study by Mahmud, et al. [2] examined the structural transformation of the public relations function from a multi-level analytical perspective, concluding that integrating AI in communication processes not only improves operational efficiency but also reshapes the strategic role of public relations within organizational structures. The study showed that institutions adopting integrated intelligent systems in public relations experienced a 47% improvement in strategic performance indicators compared to traditional models. Similarly, Richardson and Nakamura [19] presented a theoretical model of Adaptive Public Relations, based on the capability of intelligent systems to learn from past interactions and refine future strategies, emphasizing the importance of integrating AI and human expertise to strike a balance between efficiency and authenticity in communication.
- Developing Media Relations and Interaction with Journalists
  A comprehensive applied study by Nies and Zhao [20] demonstrated the transformative effect of AI on media relations management by developing an intelligent platform capable of analyzing journalists' interests and preferences and customizing press materials accordingly. The results indicated a 63% increase in media publication rates and a 38% enhancement in coverage quality through the use of intelligent systems. Additionally, the European Communication Research Institute reviewed the impact of Natural Language Processing (NLP) techniques on enhancing the effectiveness of press materials and improving the quality of communication with international media, with a focus on linguistic and cultural challenges in multinational environments [21].

2.2.2. AI-Driven Organizational Communication: Technologies and Applications

- Dynamic Content and Message Personalization
  Bhattacharya [22] conducted an in-depth study on the development of intelligent content personalization systems, highlighting the capacity of machine learning algorithms to analyze individual and group audience behavior and tailor messages according to personal, cultural, and temporal contexts. Field experiments showed that intelligently personalized content achieves engagement rates 184% higher than generic content. In a related study, Kim and Santos [23] and Mahmud, et al. [2] developed an Adaptive Communication Intelligence model that integrates big data analytics with AI technologies to generate multi-modal content (textual, visual, auditory), adapting to user preferences and behaviors across various platforms [23].
- Generative AI and Creativity in Content Production
  Vasquez reviewed recent advancements in generative AI for producing creative public relations content, emphasizing the importance of maintaining Diversity, Equity, and Inclusion (DEI) in communication materials [24]. The study concluded that combining generative AI capabilities with specialized human oversight yields optimal results in creativity and cultural appropriateness. Furthermore, Anderson added a new dimension by developing a practical framework to measure the quality of AI-generated content, including indicators for originality, relevance, impact, and social responsibility [25]. This framework was applied to a sample of 500 global organizations, enabling the development of objective standards to evaluate the effectiveness of AI in public relations.

2.2.3. Ethics and Transparency in AI-Powered Public Relations

- Building Trust and Transparency with Stakeholders
  Vujnović developed a comprehensive framework for ethical practices in AI usage within public relations, underscoring the role of practitioners as "ethical translators" of intelligent technologies for society [26]. The study proposed a "gradual transparency" model allowing organizations to disclose AI usage in ways that build trust without provoking unjustified fears. The Global Ethics Institute emphasized the need for creating practical, flexible ethical frameworks that keep pace with rapid technological advancements, with a focus on data privacy protection, fairness in audience targeting, and the prevention of algorithmic bias in intelligent communication systems [27].

2.2.4. Institutional Responsibility and Responsible Technology Use

Ward introduced an integrated model of institutional responsibility in the AI era, based on the Advanced Professional Ethics Theory, requiring public relations professionals to bear additional ethical responsibilities, ensuring the responsible and ethical use of intelligent tools [28]. The study involved developing a practical guide that covers multiple ethical aspects, ranging from privacy to transparency and accountability.

2.2.5. Research Gap

Despite significant progress in integrating artificial intelligence in organizational communication fields, the current academic literature reveals several fundamental research gaps:

1. Lack of integrative evaluation models between PR and AI: Most studies have focused on fragmented technological uses (such as sentiment analysis or personalization), without developing comprehensive models that connect these tools with institutional performance indicators or business growth metrics (ROI, Brand Equity, Engagement).
2. Shortage of applied experimental studies: The literature largely relies on descriptive or qualitative analysis approaches, lacking standardized experimental models that are generalizable across different sectors, thus limiting their usefulness for institutional decision-makers.
3. Absence of Arab/cultural framework: Studies in the Arab context are scarce both in terms of communication practice and the cultural and behavioral structure of audiences, making the direct import of Western models insufficient or sometimes inappropriate.
4. Conflicting views on AI ethics: While some studies emphasize AI's effectiveness in improving communication, others point to risks such as loss of empathy, misinformation, and ethical challenges, with no balanced regulatory framework or practical guideline available.
5. Insufficient linkage of AI to strategic decision-making: In many models, public relations is still treated as a communication support function rather than a strategic tool based on predictive analytics influencing institutional growth trajectories.

2.2.6. From This Arises the Research Gap Addressed by this Study

This work aims to develop an integrated conceptual and applied model that redefines public relations not just as a communication tool but as an innovative, data-driven platform actively contributing to business growth and enhancing institutional return on investment within a generalizable Arab cultural context. The study also proposes an analytical-experimental approach combining both technical and impact dimensions.

3. Research Methodology

3.1. Research Design and Methodology

This study employs a Mixed-Methods Design, combining quantitative and qualitative approaches within an integrative framework to provide a comprehensive and in-depth analysis of the studied phenomenon. The study follows an Explanatory Sequential Design, where quantitative data are collected and analyzed first, followed by qualitative interviews to deepen understanding and explain statistical patterns. This approach is well-suited for analyzing the relationship between AI adoption in public relations and its impact on data-driven institutional growth.

3.2. Study Population and Sample

The study population comprises various categories, including communication and public relations officers from several public and private sector institutions, particularly those that employ AI tools in their communication strategies. A Purposive Sample of 280 participants was selected, representing institutions of diverse technical and organizational nature, aiming to balance and diversify participant views. This sample size is adequate for inferential statistical testing and achieving moderate generalizability.

3.3. Study Instruments and Procedures

- Questionnaire:

The questionnaire was developed by integrating adapted standardized scales to suit study objectives, with some items tailored to the Arab context. It covers four main dimensions:

a. Level of AI adoption in public relations
b. Effectiveness of public relations strategies in achieving institutional growth
c. Indicators for measuring communication ROI
d. Technical and organizational challenges in digital communication transformation

The instrument consists of 34 items, answered on a five-point Likert scale.

- Interviews:

Semi-structured interviews were conducted with 10 senior communication and public relations officials from various targeted institutions. Designed to complement questionnaire results, the interviews explored key perceptions regarding AI roles in their institutions and its capacity to reshape PR functions.

3.4. Validity and Reliability

- *Face and content validity:* The questionnaire was reviewed by a panel of experts in media, management, and AI to ensure item compatibility with conceptual dimensions.
- *Reliability:* A pilot study with 30 respondents calculated Cronbach's alpha at ($\alpha = 0.87$), indicating an excellent reliability level.

3.5. Data Collection Methods

- *Quantitative:* Questionnaires were electronically distributed through trusted platforms to access the targeted sample.

- *Qualitative:* Interviews were conducted via direct video calls after obtaining written consent. Sessions were recorded and precisely transcribed to ensure reliable analysis.

3.6. Data Analysis

- *Quantitative:* SPSS was used for statistical analysis, including descriptive statistics (mean, standard deviation), one-sample T-tests, one-way ANOVA, and multiple regression to examine predictive relationships.
- *Qualitative:* Thematic Analysis following Braun & Clarke's steps was applied to extract central themes and shared cognitive patterns.
- *Triangulation:* Results from both methods were integrated to ensure validity and enrich the comprehensive interpretation of the phenomenon.

3.7. Ethical Considerations

- Informed consent was obtained from all participants.
- Confidentiality and anonymity principles were upheld.

Data were used strictly for scientific purposes, guaranteeing participants' freedom to withdraw without consequences.

4. Analysis and Discussion

In the following paragraphs, we present the key statistical results extracted and provide an analysis of them in light of the theoretical framework and research objectives. We discuss and analyze the primary data using several statistical methods, which enable us to understand the dimensions of relationships between variables and identify the strength of these relationships. The discussion also links the results to the Arab institutional context, highlighting their strategic and practical implications.

4.1. Instrument Reliability (Internal Consistency)

To measure the internal consistency of the questionnaire, Cronbach's alpha coefficient was calculated for each domain of the instrument as well as for the questionnaire as a whole. The results in Table 1 indicate that all values exceed 0.70, which is the minimum acceptable threshold in the social and behavioral sciences. This indicates that the instrument enjoys a high degree of reliability. It also reflects that the items formulated for the questionnaire domains measure the targeted construct homogeneously and coherently, enhancing the credibility of relying on the questionnaire results in subsequent statistical analyses.

Table 1.
Internal Consistency Results for Questionnaire Domains.

Domain	Cronbach's Alpha Coefficient
Knowledge	0.860993
Usage	0.858625
Effectiveness Perception	0.848948
Return	0.855256
Overall Questionnaire	0.708456

4.2. Descriptive Statistics Analysis

4.2.1. Levels of Awareness and Adoption of Smart Technologies

The descriptive statistics analysis shows that the levels of knowledge, usage, perception, and return related to the adoption of AI technologies in public relations all fall within the high to very high range, reflecting a generally positive trend in recognizing the inherent value of these technologies within Arab institutions.

According to the results shown in Table 2 the average knowledge score was 4.638 with a low standard deviation of 0.284, indicating a high level of theoretical agreement among the sample members. However, this theoretical elevation may reflect a case of "cognitive awareness dissociated from application," a phenomenon known as "strategic myopia" in contemporary literature, where institutions possess sound technical knowledge but fail to translate it into tangible performance.

The usage domain recorded an average of 4.406 with the lowest standard deviation among the domains (0.179), indicating some homogeneity in application, which might point to patternicity practices or what is called "technical islands," i.e., using technologies without an integrative strategic context.

In contrast, the perception domain scored an average of 4.287 with a standard deviation of 0.195, reflecting an overall positive evaluation of AI technologies, with slight variation in confidence levels possibly linked to user experience or institutional culture.

Regarding the return domain, the average was 4.580 with a standard deviation of 0.185, indicating a clear awareness of the roles AI plays in achieving calculated and tangible values in public relations. This aligns with contemporary trends in the Enhanced Shared Value Theory, which posits that integrating technology and institutional strategy produces a measurable impact that benefits both the organization and its stakeholders [9].

Table 2.
Descriptive Statistics.

Domain	Mean	Standard Deviation	Importance Level
Knowledge	4.638	0.284	Very High
Usage	4.406	0.179	Very High
Perception	4.287	0.195	High
Return	4.580	0.185	Very High

Observing the results, it is evident that Arab institutions still need to transform knowledge into measurable practices and procedures through developing a Knowledge-Performance Matrix.

4.3. One-Sample T-Test

4.3.1. From Neutrality to Institutional Acceptance of AI

A one-sample T-test was used to measure the significance of differences between the observed means in the study domains and the neutral theoretical value (3), to determine whether respondents adopt a position of acceptance towards AI technologies or maintain neutrality.

As shown in Table 3 all four domains (knowledge, usage, perception, return) recorded very high T-values, with strong statistical significance ($p < 0.001$). This clearly indicates that participants' opinions significantly exceeded neutrality, trending towards active institutional acceptance of innovative technologies.

The highest T-value was in the return domain (T = 166.210), indicating that institutions adopting AI as a choice have already started measuring its economic feasibility and linking it to tangible achieved results. This approach aligns with the cultural-technical transformation discussed in the Organizational Technology Transformation Theory, where AI evolves from being an "external innovation" to an "internal strategic necessity" [11].

Furthermore, high T-values in the usage and perception domains indicate that actual practices have become part of routine operational processes, confirming a trend towards normalizing usage and integrating technology within the institutional structure.

Accordingly, institutions should capitalize on this acceptance to develop AI governance frameworks that strike a balance between innovation and responsibility.

Table 3.
One-Sample T-Test.

Domain	T	p-value	Significance Level
Knowledge	112.004	0.000	*
Usage	152.117	0.000	*
Perception	128.289	0.000	*
Return	166.210	0.000	*

4.4. Multiple Regression Analysis

4.4.1. Equation for Achieving Return: From Theoretical Knowledge to Operational Integration

The multiple regression analysis aims to identify the independent variables with the most significant impact on achieving the "institutional return" resulting from the employment of artificial intelligence in public relations. As shown in Table 4 the model results indicate that the variables' usage' and 'perception' have a statistically significant positive effect on return, while 'knowledge' has a negative effect.

The coefficient of determination R^2 was approximately 0.553, meaning the model explains about 55.3% of the variance in the return variable, which is a high explanatory power lending strength to the analytical model used. The model's F-value was 153.8, with a significance level of $p < 0.001$, reflecting the statistical robustness of the model.

- Knowledge (B = -0.283): The adverse effect of knowledge presents a striking paradox; rather than supporting performance, increased theoretical knowledge is associated with decreased return. This can be explained by the phenomenon of "misleading knowledge" or "unproductive saturation," where individuals accumulate theoretical knowledge without activating it, resulting in delays in implementation and decision-making. This phenomenon is documented in recent literature as the "knowledge localization gap."
- Usage (B = 0.695): Indicates that the strongest determinant of return is the actual and direct use of AI technologies, reinforcing the importance of operational integration and practical application as a genuine driver of institutional value. This result aligns with the assumptions of the Complex Dynamic Value Theory, which posits that the real impact of technology occurs only when functionally integrated within existing systems [18].
- Perception (B = 0.240): This variable highlights the role of internal trust and institutional acceptance as an important motivator for return, although not as strong as usage. It suggests that a positive perception of technology facilitates adoption but does not replace actual application.

Based on the above, an interpretive equation for return can be derived as follows:

$$\text{Return} = 1.799 - 0.283 \times \text{Knowledge} + 0.695 \times \text{Usage} + 0.240 \times \text{Perception}$$

This emphasizes the importance of converting knowledge into measurable practices and building organizational capacities based on operational maturity rather than merely theoretical awareness.

Table 4.
Multiple Regression Results.

Independent Variable	Coefficient (B)	p-value	Effect
Constant	1.799	0.000	Significant
Knowledge	-0.283	0.000	Negative
Usage	0.695	0.000	Positive
Perception	0.240	0.000	Positive

Model indicators: $R^2 = 0.553$, $F(3,276) = 153.8$, $p < 0.001$.

4.5. Analysis of Variance (ANOVA)

4.5.1. Gender and Age as Determinants for Technology Adoption

One-way ANOVA was used to test the significance of differences between participants' responses according to their demographic characteristics, especially gender and age, to determine if these variables affect the level of AI technology adoption in public relations.

Results indicate statistically significant differences for gender in the domains of perception and usage: females showed higher levels of positive perception compared to males, while males demonstrated higher levels of practical usage. Regarding age, the 35–44 age group recorded the highest return rates, suggesting that this group might represent a "balance point" between experience and technological agility.

These differences can be interpreted by the Arab institutional cultural model, which posits that institutional culture does not treat technology uniformly but reshapes it according to individuals' perceptions and functional and social roles. This analysis opens the door to adopting behavioral adaptation strategies by designing training and awareness programs tailored to specific target groups, rather than following a generic model.

It is recommended that institutions adopt the Hybrid Workforce Model, which combines the strategic experience of older workers with the technical application skills of younger ones. Researchers are also encouraged to study the impact of demographics on technology adoption in conservative cultures.

Table 5.
ANOVA Results by Demographic Variables

Variable	Knowledge (p-value)	Usage (p-value)	Return (p-value)
Gender	0.037*	0.010	0.000*
Age	0.000*	-	-

4.6. Pearson Correlation Analysis

4.6.1. Interrelated Influence Network among Smart Public Relations Components

Pearson correlation was conducted to analyze linear relationships among the four study variables: knowledge, usage, perception, and return. Results revealed an interconnected network of effects, except that the correlation between knowledge and return was significantly negative.

This negative correlation is counterintuitive but explained by the "unproductive theoretical accumulation" phenomenon, where knowledge accumulation without practical application results in a value gap, particularly when knowledge is not effectively translated into practical use.

Conversely, usage was positively and strongly correlated with both perception and return, reflecting its role as a dynamic mediating variable linking theoretical input (knowledge) to strategic output (return). This underscores the importance of adopting a framework that prioritizes technological application over theoretical accumulation, especially in environments marked by administrative rigidity or weak institutional motivation.

Based on these findings, institutions should apply the "70/20/10 principle," allocating 70% of resources to practical application, 20% to theoretical knowledge, and 10% to innovative experimentation. Researchers should develop a "Knowledge Conversion Efficiency" index accordingly.

Table 6.
Pearson Correlation Coefficients.

Variable	Knowledge	Usage	Return
Knowledge	1	0.144	-0.343
Usage	0.144	1	0.556
Return	-0.343	0.556	1

4.7. Exploratory Factor Analysis (EFA)

4.7.1. Statistical Basis for Constructing the Performance Matrix

To verify the validity and reliability of the research instrument's domains, Exploratory Factor Analysis was used with Kaiser's criterion and Varimax rotation. Results showed that all items loaded onto four main factors consistent with the theoretical structure of the instrument (knowledge, usage, perception, return), confirming the expected factorial structure.

The Kaiser-Meyer-Olkin (KMO) measure was 0.894, an excellent value indicating sample adequacy, and Bartlett's test was statistically significant with $p < 0.001$,, enhancing confidence in the results' validity.

These results support the scientific reliability of the instrument as a measurable construct and open the possibility of localizing the tool in Arabic as a unified Arab standard for evaluating brilliant communication performance. It is recommended that institutions adopt this as a "Smart Dashboard" for monitoring public relations performance.

Table 7.
Factor Loadings.

Domain	Average Loading	Loading Range
Knowledge	0.81	0.72–0.89
Usage	0.79	0.68–0.91
Return	0.79	0.70–0.88

In summary, the findings refute the belief that possession of technology guarantees growth, confirming that value stems from strategic integration (Triple Integration Theory).

The concept of "knowledge" must be redefined, as theoretical knowledge becomes a burden without conversion mechanisms, requiring the development of Applied Knowledge Theory.

If further translation or other sections are required, please let me know. Here is the English translation for the requested sections on multiple regression analysis, ANOVA, Pearson correlation, and exploratory factor analysis:

4.8. Results of Moderated Regression Analysis

A test was conducted to examine whether "institutional data quality" (proxy) moderates the relationship between "use of artificial intelligence" and "business outcomes (ROI)", and the results are as follows:

4.9. Main Statistical Results

Table 8.
Moderated Regression Analysis Results.

Variable	Coefficient	p-value	Statistically Significant?
Use of Artificial Intelligence	13.26	< 0.001	Yes
Data Quality	11.47	< 0.001	Yes
Interaction	-2.56	< 0.001	Yes

(R^2 = 0.668) The model explains 66.8% of the variance in business outcomes.

The interaction coefficient is negative and significant, indicating that the impact of artificial intelligence on business outcomes decreases as data quality increases. This phenomenon may be explained by a saturation point or independence in the effect of the data itself.

The results showed that institutional data quality has a fundamental impact on the relationship between AI use and return on investment in public relations (beta equals -2.56, $p < 0.001$). This suggests that the relationship between AI and business results weakens when high-quality data are available, possibly reflecting saturation or a reduced reliance on AI when data is inherently strong.

The study also demonstrated that the practical use of AI and a positive perception of it are the most influential factors in achieving institutional returns. Regression analysis revealed that usage was the strongest variable (B = 0.695), followed by perception (B = 0.240); theoretical knowledge, however, had a negative association with return (B = -0.283). This means that accumulation of knowledge without conversion into practical application does not enhance institutional value and may even hinder it.

This finding aligns with Porter and Kramer [9]. Theory, which emphasizes that technology acquires value when transformed into measurable economic and social outcomes [9]. It also agrees with Schmidt and Liu [18] who confirmed that integrating AI into operational processes is the actual driver of institutional impact [18]. Conversely, these results differ from some literature, such as Johnson and Martinez [8] who posited that theoretical knowledge is essential for digital transformation success, highlighting the specificity of the Arab context, where practical application precedes theoretical knowledge in defining institutional success [8].

Additionally, the ANOVA results clarified that demographic factors, such as gender and age, play crucial roles in shaping technology adoption paths. Females exhibited more positive perceptions of AI, while males achieved higher levels of practical usage. The 35– 44 age group showed the highest institutional return rates. These results align with Vujnović, et al. [26] findings regarding the cultural and demographic influences on organizational behavior and support Al Omari [29] observations about the distinctiveness of Arab organizational culture in innovation adoption. Hence, these findings underscore the need for tailored training and development strategies that address different demographic groups, rather than adopting a one-size-fits-all approach [8].

Correlation analysis revealed a negative relationship between knowledge and return (r = -0.343), which contrasts with Western literature that generally assumes a positive correlation, as in Davis [30] Technology Acceptance Model. This outcome can be explained by the phenomenon of unproductive knowledge accumulation, where organizations stock theoretical knowledge that is not translated into applicable and measurable tools. Conversely, usage was strongly and positively correlated with both perception and return, indicating its role as a mediating variable linking theoretical input

(knowledge) to strategic output (return). This supports calls to develop evaluation models focusing on actual usage as a core element, as recommended by recent studies in similar contexts [23].

Finally, Exploratory Factor Analysis (EFA) confirmed the validity of the tool used, showing that the four main factors (knowledge, usage, perception, return) are consistent with the expected theoretical structure. The Kaiser [31] measure was high (0.894) and Bartlett's test was significant ($p < 0.001$), supporting the tool's reliability. These results not only affirm the instrument's credibility but also support its localization in the Arab context as a standardized framework for evaluating the maturity of smart public relations. This addresses gaps noted by Lee and Kim [32] regarding the absence of locally specialized tools for measuring AI adoption in non-Western contexts [23].

In summary, the study's findings reveal that the institutional value of AI in the Arab context depends on its conversion into practical, measurable applications and its adaptability to cultural and organizational factors. This supports some international literature on the applied value of technology, but differs by emphasizing the negative role of separated theoretical knowledge from practice. This opens the way for developing authentic Arab models for AI management and evaluation that consider specific cultural and demographic institutional characteristics.

4.10. Discussion of Results in Light of the Study Questions and Hypotheses

4.10.1. Answers to the Study Questions

Main Question: How do artificial intelligence technologies reshape the functional and strategic structure of public relations in the Arab context?

The results indicate that artificial intelligence has reshaped public relations from a traditional function reliant on theoretical knowledge to a strategic applied system based on practical usage and positive perception. Regression analysis revealed that usage is the strongest factor explaining return ($B = 0.695$), while knowledge has a negative relationship ($B = -0.283$), indicating that possessing knowledge alone is insufficient to achieve institutional growth. This finding aligns with Porter and Kramer [9] on the realization of shared value through actual practices. It differs from Johnson and Martinez [8] who prioritized knowledge as crucial for the success of digital transformation. Thus, the actual value of AI in the Arab context lies more in measurable, tangible applications rather than mere awareness or theoretical training.

RQ1: What are the structural characteristics of the paradigmatic shift in public relations?

The data revealed three main characteristics of the shift: first, prioritizing practical usage over theoretical knowledge ($B = 0.695$ vs. $B = -0.283$); second, direct usage correlates with measurable financial outcomes ($R^2 = 0.553$); and third, cultural and demographic factors, such as gender and age, influence adoption. These traits align with Schmidt and Liu [18] who stated that integrating technology into operations creates structural changes in organizations, supporting Hofstede's findings that link organizational structure to cultural context [18].

RQ2: What are the prevailing patterns in AI employment?

The results revealed three main patterns: a practical pattern focusing on usage as a central growth tool, a cultural pattern reflecting gender and age differences in adoption, and an economic pattern measuring value through institutional return on capital investment (ROCI). These patterns align with Al Omari [29] findings, which suggest that adoption is influenced by intersecting cultural, economic, and organizational factors in the Arab context [29].

RQ3: What is the effect of organizational and cultural variables on adoption?

ANOVA results indicated institutional size is not a decisive factor (H5 rejected), whereas cultural and demographic factors have apparent effects; age groups and gender showed statistically significant differences in usage and perception. This reinforces Hofstede's thesis that culture has more influence than structure in explaining individual and organizational behavior [23].

RQ4: How effective are current analytical models in explaining the phenomenon?

Applied models, such as ROCI, demonstrated high effectiveness ($R^2 = 0.553$), while theoretical knowledge-based models showed a limited or inverse impact. This is consistent with recent trends that call for local models to measure actual performance rather than solely knowledge [23].

RQ5: What are the strengths and weaknesses in the Arab context?

Strengths included high theoretical awareness (mean = 4.638) and broad technology acceptance ($p < 0.001$ across all axes). Weaknesses were identified in the application gap ($B = -0.283$) and practice variance across demographic groups. These findings are consistent with Al Omari [29] who noted high awareness alongside weak practical application [29].

4.10.2. Hypothesis Testing

- H1 and H2: The model explained over 55% of the variance in business outcomes ($R^2 = 0.553$), exceeding accepted theoretical thresholds (35% and 40%), supporting both hypotheses. This accords with Schmidt and Liu [18] findings on the effectiveness of AI-based applied models in enhancing institutional performance [18].
- H3: AI use showed a substantial effect on outcomes, exceeding traditional effect levels by three times ($B = 0.695$), confirming the hypothesis.
- H4: Tested via a moderation model, institutional data quality significantly moderated the relationship between AI use and return on investment ($\beta = -2.56$, $p < 0.001$). This implies the relationship weakens as data quality increases, possibly reflecting cognitive saturation or self-reliance on strong data; thus, the hypothesis holds in its modified form.
- H5: No statistically significant differences due to institution size were observed, leading to rejection of the hypothesis. This indicates cultural and organizational factors may outweigh size effects in explaining institutional differences, consistent with prior findings in the Arab context.

The study supports recent literature emphasizing the strategic integration and practical application of AI in organizational communication [9, 18]. It also highlights structural contrasts with some Western literature [8, 23] which focuses on theoretical knowledge as critical. These differences reflect the specificity of the Arab context, where cultural and demographic factors are key to the success of digital transformation, necessitating the development of localized models that address these specificities and fill gaps in traditional literature.

5. Results and Recommendations

5.1. Results

The study results show that the institutional value of AI in public relations is not achieved simply by possessing technical knowledge but depends on converting that knowledge into measurable, practical applications. Regression analysis revealed that practical use is the most influential factor on return (B = 0.695), followed by positive perception (B = 0.240), while theoretical knowledge had a negative impact (B = -0.283). This reflects that application outweighs theorizing in determining institutional success in the Arab context.

Results also highlighted the importance of cultural and demographic factors in shaping adoption paths, where gender and age are key determinants: females have more positive perceptions, males exhibit higher practical use, and the 35–44 years age group records the highest return rates. This confirms that adoption is not merely technical, but is influenced by the cultural and social context of organizations.

Moreover, exploratory factor analysis validated the research tool's reliability and coherence in measuring the four study axes (knowledge, usage, perception, and return), paving the way for its localization as a standard instrument in Arab environments. The theoretical contribution lies in redefining public relations from a traditional cognitive function to an innovative strategic system focused on usage, return, and cultural adaptation.

5.2. Practical Recommendations

Based on the results, a set of recommendations is offered to Arab institutions seeking to enhance AI's role in public relations:

- Focus resources on practical application: Allocate at least 70% of resources to actual AI applications (e.g., sentiment analysis, digital campaign management), 20% for theoretical training, and 10% for innovative experimentation.
- Build AI governance frameworks: Ensure balance between innovation and ethical responsibility, respecting the particularities of Arab institutions.
- Design tailored training programs: Account for age and gender differences in training and development plans, utilizing a "hybrid workforce" model that leverages senior expertise and younger technical skills.
- Adopt intelligent dashboards: Use active indicators such as usage rates and positive perception levels as primary tools for performance evaluation, rather than relying on theoretical knowledge.
- Redefine KPIs: Build them around "usage" and "perception" as primary indicators for return, excluding theoretical knowledge as a direct factor.

5.3. Future Research Recommendations

- Verify the role of data quality as a moderating factor: After confirming it moderates the AI usage–business outcomes relationship, recommend field studies using more complex interaction and structural models, and develop a comprehensive institutional data quality scale covering accuracy, timeliness, consistency, and completeness.
- Reevaluate the impact of institutional size in light of cultural factors: Given size's insignificance in explaining variance, suggest comparative studies breaking down interactions among size, organizational, and cultural factors, focusing on sectoral differences (education, health, media, etc.).
- Design localized models for communication AI: Encourage future research to develop local models for Return on Communication Intelligence (ROCI) tailored to Arab cultural and organizational contexts, linking communication impact with long-term institutional sustainability.
- Comparative studies across organizational cultures: To understand generalizability or specificity of findings, recommend comparing explanatory frameworks in the Arab context with similar ones in global environments (Europe, Asia, America), to ascertain whether practical application effectiveness consistently outperforms theoretical knowledge.
- Integrate ethical and governance dimensions in adoption models: Expand future research to include ethical governance indicators in AI applications within public relations, such as transparency, fairness, privacy, and algorithmic bias, due to their direct impact on institutional trust and sustainability of adoption.

6. Conclusion

This study confirms that the key to successful AI implementation in public relations within the Arab context lies in the practical application and strategic integration, rather than the accumulation of theoretical knowledge. Institutions capable of transforming technology into measurable practices will be empowered to enhance economic and social returns. At the same time, those relying only on theoretical knowledge will remain trapped in a performance gap.

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