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Investigating the Effect of Artificial Intelligence Capability on Business Performance Through the Mediating Role of Open Innovation and the Moderating Role of Environmental Dynamism in the Startup Ecosystem (Case Study: Bextudio Startup)

ABSTRACT

The present study investigates the effect of artificial intelligence capability on business performance through the mediating role of open innovation and the moderating role of environmental dynamism in the startup ecosystem (case study: Bextudio Startup). This research was conducted using a descriptive-survey methodology. The statistical population consisted of all middle and senior managers of Bextudio Startup in Tehran. The sample size was determined to be 92 individuals using Cochran's formula. Sampling was conducted through simple random sampling. Data were collected using both library research and field methods, and the main data collection instrument was a questionnaire. The reliability of the questionnaire was confirmed using Cronbach's alpha coefficient (0.858), and its validity was confirmed through content validity assessment. The collected data were analyzed using SMARTPLS software and descriptive and inferential statistical tests. The findings indicated that artificial intelligence capability has a significant effect on business performance. Furthermore, the results demonstrated that the effect of artificial intelligence capability on business performance is significantly mediated through open innovation.

Keywords: Artificial Intelligence Capability, Business Performance, Open Innovation, Environmental Dynamism Moderator

Introduction

Contemporary public organizations operate in an environment characterized by institutional complexity, increasing stakeholder expectations, rapid technological change, knowledge intensity, interorganizational interdependence, and growing demands for transparency, accountability, participation, and responsiveness. Under such conditions, traditional governance mechanisms based predominantly on formal authority, hierarchical control, legal mandates, sanctions, and standardized administrative procedures may no longer be sufficient to ensure organizational effectiveness. Although formal rules and coercive mechanisms remain indispensable to public administration, the effective coordination of organizational actors increasingly depends on complementary mechanisms such as trust, persuasion, shared norms, participation, communication, organizational learning, ethical leadership, and voluntary commitment. This development has contributed to growing scholarly interest in the concept of **soft governance**, which emphasizes the capacity to coordinate behavior and achieve collective objectives through relational, normative, cognitive, and participatory mechanisms rather than relying

exclusively on command-and-control arrangements. Soft governance therefore represents an important extension of conventional governance thinking by recognizing that managerial influence can be exercised through legitimacy, cooperation, knowledge, values, and interpersonal relationships as well as through formal power [1-3].

The distinction between hard and soft forms of governance is fundamental to understanding this shift. Hard governance is generally associated with binding laws, formal regulations, hierarchical authority, contractual obligations, monitoring systems, and enforceable sanctions, whereas soft governance relies more heavily on guidelines, shared expectations, voluntary standards, negotiation, persuasion, networks, benchmarking, and social or professional norms. Nevertheless, these two modes should not necessarily be regarded as mutually exclusive. In practice, organizations and institutional systems often combine hard and soft mechanisms to regulate behavior and coordinate activities. The literature on soft law and governance demonstrates that nonbinding arrangements can exercise substantial influence despite lacking the formal enforceability traditionally associated with law or administrative authority [4, 5]. Indeed, unofficial rules and guidelines may produce significant practical consequences because organizational actors perceive them as legitimate, appropriate, professionally expected, or strategically advantageous. Brandsen et al. demonstrated the inherently ambiguous but consequential status of such unofficial governance arrangements, showing that apparently “soft” instruments may create behavioral effects comparable to those of formal requirements [6]. More recently, historical analyses of large projects have further emphasized that effective governance commonly depends on configurations of both hard and soft mechanisms rather than the isolated application of either mode [7].

The relevance of soft governance is especially apparent in complex public-sector settings, where multiple actors with different professional identities, institutional responsibilities, interests, and sources of authority must cooperate in accomplishing collective goals. Government organizations cannot rely exclusively on managerial orders because many organizational outcomes require discretionary effort, information exchange, professional judgment, collaboration, and acceptance by employees. Soft governance can facilitate such coordination by cultivating conditions in which individuals willingly align their behavior with organizational objectives. Experiences of European governance illustrate how coordination may occur through consensus-building, policy learning, benchmarking, mutual adjustment, and other noncoercive instruments. Research on European governance has shown that soft modes of coordination can become institutionalized as meaningful mechanisms through which policy priorities are communicated and organizational or national practices are shaped [8]. In educational governance, for example, soft power and consensus-oriented coordination have been used to influence national and organizational priorities without necessarily replacing formal authority [9]. Earlier work on European learning spaces similarly demonstrated how information exchange, comparison, networking, and mutual learning can function as soft governance technologies capable of shaping institutional behavior across organizational and national boundaries [10].

At the organizational level, soft governance is closely associated with the management of intangible resources and relational processes. Unlike traditional administrative approaches that emphasize structures, procedures, and positional authority, soft governance recognizes that organizational performance also depends on employees’ perceptions, social relationships, emotional experiences, knowledge-sharing behavior, and willingness to cooperate. This perspective is consistent with the broader concept of organizational soft power, according to which organizations influence stakeholders not simply through material resources or formal authority but also through credibility, values, reputation, relationships, and

attractive organizational practices. Research has shown that emotions themselves can function as organizational soft power because emotional dynamics influence identification, relationships, commitment, and collective action [11]. Similarly, organizational soft power has been linked to human resource management, corporate social responsibility, and sustainable performance, suggesting that organizations can enhance long-term effectiveness through practices that generate commitment and legitimacy rather than merely imposing compliance [12]. The application of soft-power reasoning to open knowledge also demonstrates how influence may be generated through openness, intellectual exchange, accessibility, and relationship-building, further highlighting the importance of noncoercive resources in contemporary organizations [13].

One particularly important domain of soft governance concerns knowledge and organizational learning. Government organizations are increasingly knowledge-intensive institutions in which effective decision-making depends on the acquisition, transfer, integration, and use of information distributed across individuals and organizational units. Consequently, governance mechanisms must not only regulate formal responsibilities but also create conditions conducive to voluntary knowledge sharing. Foss et al. argued that knowledge-sharing behavior should be examined through multiple levels of analysis and emphasized the importance of governance mechanisms in facilitating or constraining the exchange of organizational knowledge [14]. This issue is particularly salient in the public sector, where organizational characteristics, departmental boundaries, professional specialization, and bureaucratic structures can significantly influence interdepartmental knowledge sharing [15]. Research on knowledge governance has similarly highlighted the relationship between governance arrangements and organizational or project performance, indicating that the management of knowledge flows is not merely a technical issue but also a governance concern [16]. From a systems perspective, organizational knowledge governance encompasses interconnected dimensions that influence the creation, exchange, utilization, and institutionalization of knowledge [17]. Accordingly, organizational learning can be regarded as an essential dimension of soft governance because learning depends substantially on empowerment, communication, experimentation, teamwork, knowledge transfer, and shared understanding rather than formal authority alone.

Soft governance is also strongly associated with the quality of leadership and interpersonal relationships. In contemporary organizations, managerial effectiveness increasingly depends on leaders' ability to build trust, facilitate participation, empower employees, communicate meaning, demonstrate fairness, and establish ethical legitimacy. Leadership practices based exclusively on control may produce formal compliance without creating genuine commitment. Conversely, leadership approaches that emphasize empowerment and mentoring can strengthen employee agency and encourage individuals to contribute beyond narrowly prescribed job requirements [18]. Cultural and social foundations also shape the meaning and effectiveness of leadership, demonstrating that governance practices must be interpreted within the relational and institutional contexts in which managers and employees interact [19]. Ethical leadership is particularly relevant to soft governance because employees' acceptance of managerial influence depends partly on perceptions of fairness, integrity, ethical guidance, responsible power sharing, and consistency between managerial discourse and behavior. Furthermore, employee emotional intelligence can contribute to citizenship behavior and job performance by improving interpersonal interactions and employees' capacity to understand and regulate workplace relationships [20]. These findings support the view that soft governance involves not only institutional arrangements but also the micro-level behavioral processes through which managers create cooperation and voluntary alignment.

Trust, organizational justice, perceived organizational support, and participation constitute additional relational foundations of soft governance. Trust reduces the need for extensive monitoring because actors who perceive managers and colleagues as honest, competent, consistent, and open are more willing to accept vulnerability and cooperate. Organizational justice similarly affects whether managerial decisions and organizational procedures are interpreted as legitimate. When employees perceive distributive, procedural, and interactional justice, they are more likely to regard organizational authority as fair and worthy of voluntary support. Perceived support can reinforce these processes by communicating that the organization values employee contributions and is attentive to their interests, thereby strengthening reciprocal commitment. Participation additionally transforms employees from passive recipients of managerial decisions into active contributors to organizational governance through consultation, joint decision-making, self-management, and acceptance of responsibility. These relational mechanisms are particularly important in public organizations, where formal bureaucratic structures must coexist with professional autonomy and where implementation frequently depends on employee discretion. Broader studies of the future of governance likewise indicate movement toward more adaptive, participatory, networked, knowledge-based, and responsive approaches, increasing the strategic importance of these softer coordination mechanisms [21].

Communication is another central mechanism through which soft governance is enacted. Formal structures may specify authority relationships, but managers cannot generate meaningful coordination unless organizational members have access to timely, accurate, complete, and relevant information and receive appropriate feedback. Communication enables employees to understand expectations, interpret organizational priorities, resolve ambiguities, exchange knowledge, and coordinate interdependent activities. More importantly, communication provides the medium through which trust, ethical guidance, support, learning, and participation become operational realities rather than abstract organizational values. Technological developments have expanded the importance of information transparency and accessibility in governance. For example, research on government open-data platforms indicates that public-sector information infrastructures can influence organizational behavior and broader governance outcomes by increasing access to information and creating new accountability and stakeholder pressures [22]. Similarly, emerging governance challenges associated with artificial intelligence have stimulated the development of soft-law programs based on voluntary standards, principles, guidelines, and cooperative mechanisms, demonstrating the continued relevance of flexible and information-intensive governance arrangements in rapidly changing environments [23].

Humility represents another increasingly relevant managerial quality within a soft governance framework. Managerial humility involves the willingness to reassess one's own assumptions, acknowledge personal limitations, recognize the strengths and contributions of others, learn from employees, and remain open to new ideas and feedback. These characteristics are particularly important in knowledge-intensive and uncertain environments because managers cannot reasonably assume that hierarchical position provides exclusive access to expertise. Humility therefore complements participation and organizational learning by reducing status barriers and legitimizing upward communication. It also reinforces ethical leadership because leaders who acknowledge limitations and value subordinate contributions are more likely to be perceived as authentic and respectful. Such relational qualities can make governance more adaptive by shifting managerial practice from unilateral direction toward interaction, dialogue, and collective problem-solving. This orientation corresponds with recent theoretical developments suggesting that soft governance can play a central role in designing organizations expected to pursue multiple purposes simultaneously. In dual-purpose organizations, soft governance

mechanisms can help reconcile competing objectives by influencing interpretation, commitment, and coordination without requiring rigid structural separation or excessive formalization [24].

These considerations are especially relevant to government organizations because public managers operate under conditions of multiple accountability, political and administrative constraints, diverse stakeholder expectations, formalized procedures, and limited flexibility in the use of conventional material incentives. In such environments, managers frequently need to obtain cooperation through legitimacy, communication, professional respect, trust, learning, and shared purpose. Soft governance therefore does not imply the abandonment of regulation or formal accountability; rather, it concerns the managerial mechanisms that complement formal governance and improve its effectiveness. The coexistence of hard and soft governance can be understood as a continuum in which formal mechanisms provide institutional stability while relational mechanisms create adaptability and voluntary cooperation. Evidence from governance research increasingly supports this integrative perspective, indicating that soft mechanisms can influence organizational conduct even when formal authority remains structurally dominant [5, 7]. Consequently, identifying the specific organizational dimensions through which managers enact soft governance is important both theoretically and practically.

Despite the growing literature, several conceptual gaps remain. Much of the existing research has examined soft governance at macro-level, supranational, regulatory, policy, or interorganizational levels, particularly in relation to soft law, European governance, unofficial guidelines, education policy, and emerging technologies [4, 6, 9, 23]. Other studies have investigated particular organizational mechanisms—such as knowledge sharing, soft power, leadership, knowledge governance, or open information—without integrating them into a multidimensional managerial model of soft governance [11, 13, 14, 16]. Although soft technologies have been recognized as essential instruments for effective governance and soft governance has been introduced as an important alternative or complement to conventional administrative mechanisms, empirical clarification of its managerial components within government organizations remains limited [1, 2]. Moreover, while government soft power has been conceptually associated with functions of governance, further research is required to translate this broad concept into empirically measurable organizational dimensions [3]. Establishing such dimensions is essential for moving from general conceptual discussions toward a validated model that can guide managerial assessment and organizational development.

Accordingly, the present study conceptualizes managers' soft governance as a multidimensional organizational phenomenon incorporating perceived support, organizational justice, trust, participation, organizational learning, communication, ethical leadership, and humility. These dimensions collectively represent mechanisms through which managers can influence employees and coordinate organizational action without depending solely on formal coercion. Examining these dimensions together provides an opportunity to integrate structural, behavioral, relational, ethical, and knowledge-oriented perspectives on governance. Such an integrated model is particularly valuable in government organizations, where formal bureaucracy remains necessary but must increasingly be complemented by flexible mechanisms capable of fostering cooperation, knowledge exchange, responsiveness, legitimacy, and employee engagement. By empirically examining the factor structure of these components, the study can contribute to the conceptual development of soft governance while offering public managers a more systematic basis for understanding the noncoercive mechanisms available for directing and coordinating organizational behavior.

Therefore, the aim of the present study was to identify, validate, and empirically explain the components of managers' soft governance and to develop a factor-analytic model of soft governance in government organizations.

Methodology

This section describes the research methods employed in this study, including sampling procedures, data collection methods, questionnaire validity and reliability assessment, and statistical analysis techniques. Sampling is a process through which a number of units are selected in a manner that represents a larger population. In this study, judgmental sampling was employed. The statistical population consisted of middle and senior managers of Bextudio Startup located in Tehran. Considering a 95% confidence level and a standard deviation of 0.5, the total sample size was calculated as 92 participants.

The data collection instrument used in this study was a standardized questionnaire consisting of three main sections: demographic information (gender, age, education level, and work experience) and research variables measured using a five-point Likert scale. The questionnaire was designed to measure the research variables and was developed based on standardized measurement criteria. To confirm the validity and reliability of the instrument, various methods, including face validity and content validity, were applied.

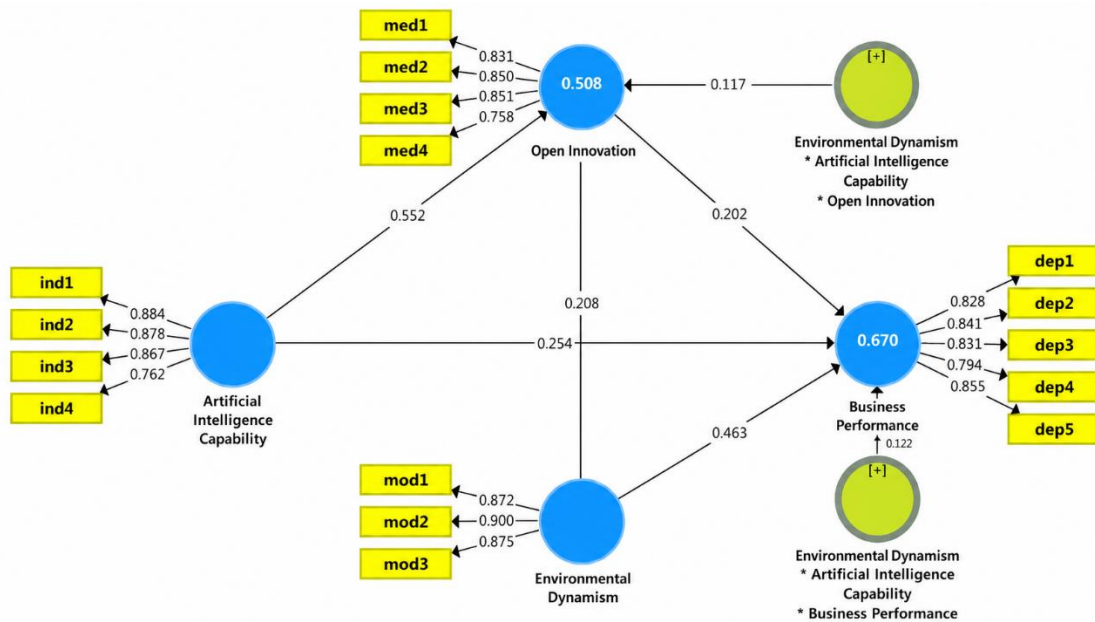
To assess the validity of the questionnaire, face validity and content validity were examined. For face validity, five professors and experts in the field of branding reviewed the appearance and structure of the questionnaire, and after implementing the required modifications, the questionnaire was approved. Regarding content validity, Lawshe's coefficient and the Content Validity Ratio (CVR) and Content Validity Index (CVI) were used to evaluate the level of agreement among experts. The results obtained from the CVR and CVI assessments indicated that the questionnaire possessed adequate content validity because all items were considered appropriate and relevant to the research topic by the experts.

The reliability or internal consistency of the questionnaire was examined using Cronbach's alpha coefficient. This index indicates the degree of internal correlation among different components of the questionnaire. According to the results, Cronbach's alpha coefficients for all variables were above 0.8, demonstrating the high reliability of the measurement instrument. These findings confirm that the questionnaire has a high level of reliability. In this study, SMART PLS software was used for data analysis.

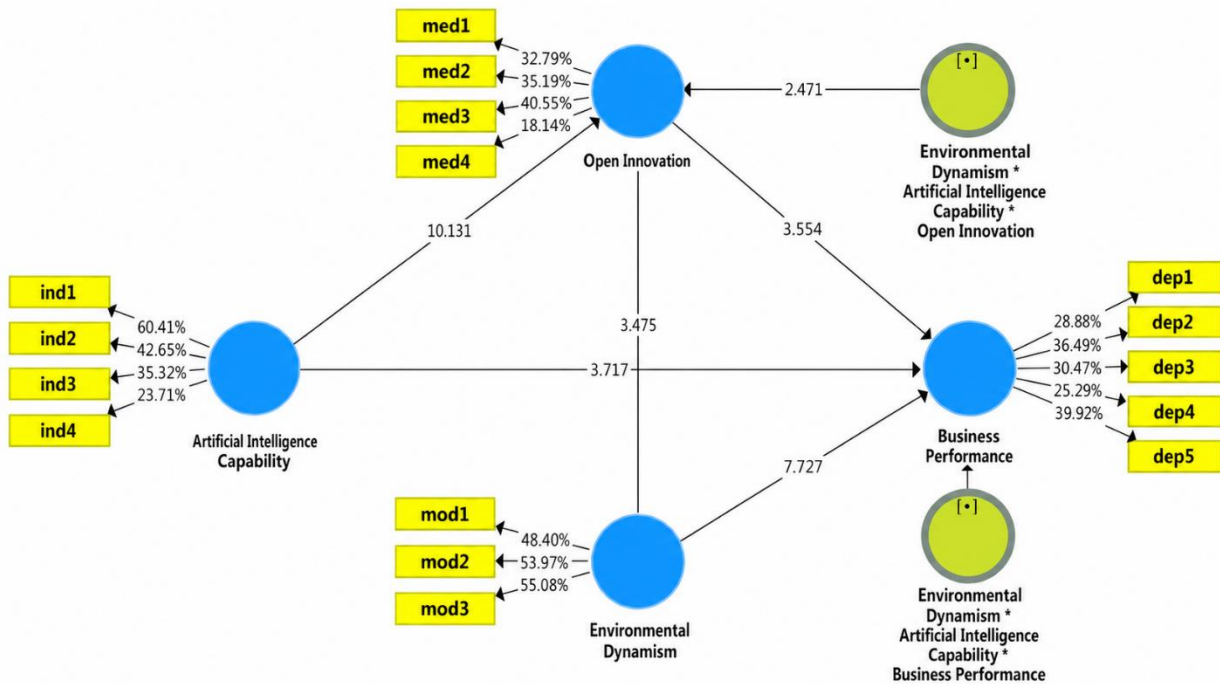
Findings and Results

To examine the relationships among the research variables and test the formulated hypotheses, structural equation modeling (SEM) using the Partial Least Squares (PLS) approach was employed. This method is particularly suitable when data do not follow a normal distribution and when the conceptual model is complex. In this study, the non-normal distribution of the data was confirmed using the Kolmogorov–Smirnov test. Therefore, the application of the PLS approach as a practical and reliable statistical modeling technique was considered an appropriate choice for this research.

The PLS method is capable of modeling complex relationships among variables in nonlinear models and provides appropriate accuracy and interpretability for non-normally distributed data. Accordingly, the selection of this method is recommended in applied and survey-based studies involving multiple variables and complex structural relationships.

Figure 1*Overall Research Model in Standardized Mode*

In this study, SmartPLS software was used to analyze the measurement and structural models. This software provides advanced capabilities for simultaneously evaluating relationships between latent variables (constructs) and observed variables (indicators). Furthermore, it enables researchers to assess the theoretical validity of the proposed model by examining path coefficients, model fit indices, and factor loadings.

Figure 2*Overall Research Model in Significance Mode*

The factor loadings indicated that all measurement items had loadings greater than 0.6; therefore, convergent validity was confirmed. The relationships among latent variables corresponding to the research hypotheses were reported as significant, with positive path coefficients and T-statistics greater than 1.96 at the 95% confidence level.

To evaluate the validity and reliability of the measurement constructs in the structural equation model, factor loadings, Cronbach's alpha, composite reliability (CR), convergent validity (Average Variance Extracted; AVE), and discriminant validity (Fornell–Larcker criterion) were calculated and presented.

For assessing the reliability of variables, Cronbach's alpha is considered a key indicator in evaluating the internal consistency reliability of the model. This coefficient ranges from 0 to 1, with values above 0.7 considered acceptable, while values below 0.6 are regarded as undesirable.

In addition, composite reliability is considered a more appropriate and reliable criterion than Cronbach's alpha in structural models because Cronbach's alpha assumes that all indicators of a construct contribute equally to the calculation, whereas composite reliability assigns greater importance to indicators with higher factor loadings. Therefore, CR values provide a more realistic and accurate assessment of construct reliability compared with Cronbach's alpha. Similar to Cronbach's alpha, composite reliability ranges from 0 to 1, and values above 0.7 are considered acceptable, while values below 0.6 are considered inadequate (Werts et al., 1974).

Furthermore, convergent validity was also assessed. When one or more characteristics are measured through two or more methods, correlations among these measurements provide important evidence of validity. If the correlations among test scores measuring the same construct are high, the questionnaire demonstrates convergent validity. Such correlations are essential for ensuring that the measurement instrument accurately assesses the intended construct. In this study, the Average Variance Extracted (AVE) was used to evaluate the convergent validity of constructs. The AVE coefficient ranges from 0 to 1, and values greater than 0.5 are considered acceptable (Hair et al., 2019).

The following criteria were considered:

Table 1

Convergent Validity and Reliability of Research Variables

Symbol	Variable	Cronbach's Alpha	AVE	CR
D1	Artificial Intelligence Capability	0.726	0.563	0.816
D2	Business Performance	0.722	0.519	0.853
D3	Open Innovation	0.738	0.534	0.740
D4	Environmental Dynamism	0.764	0.538	0.755

According to the results presented in the table above, Cronbach's alpha coefficients for all variables were greater than 0.7; therefore, the reliability of all constructs was confirmed. The Average Variance Extracted (AVE) values were consistently greater than 0.5, confirming convergent validity. Moreover, composite reliability (CR) values were higher than both the AVE values and the acceptable threshold of 0.7, indicating that all model constructs possessed satisfactory reliability and validity.

In addition, the results of hypothesis testing demonstrated that all six formulated hypotheses were confirmed at the 95% confidence level. According to the findings, artificial intelligence capability had a positive and significant effect on open innovation, with a path coefficient of 0.552 and a T-statistic of 10.131. This relationship represented the strongest relationship in the proposed model. Furthermore, artificial intelligence capability had a direct and significant effect on business

performance with a coefficient of 0.254, while open innovation had a direct and significant effect on business performance with a coefficient of 0.202.

Regarding the moderating and mediating effects, environmental dynamism positively and significantly strengthened the relationship between artificial intelligence capability and open innovation ($\beta = 0.117$, $T = 2.471$) as well as the relationship between artificial intelligence capability and business performance ($\beta = 0.122$, $T = 2.805$). Moreover, open innovation played a significant mediating role in transmitting the effect of artificial intelligence capability on business performance ($\beta = 0.148$, $T = 2.943$).

Overall, these findings indicate that artificial intelligence capability improves business performance in Bextudio Startup both directly and indirectly through facilitating open innovation. This effect becomes more prominent and strengthened in dynamic and turbulent environments.

Table 2

Hypothesis Testing Results

Hypothesis	Beta	t-value	Significance Level	Hypothesis Status	Relationship Direction
Artificial Intelligence Capability → Open Innovation	0.552	10.131	0.000	Confirmed	+
Artificial Intelligence Capability → Business Performance	0.254	3.717	0.000	Confirmed	+
Open Innovation → Business Performance	0.202	3.554	0.000	Confirmed	+
Environmental Dynamism → Artificial Intelligence Capability → Open Innovation	0.117	2.471	0.000	Confirmed	+
Environmental Dynamism → Artificial Intelligence Capability → Business Performance	0.122	2.805	0.000	Confirmed	+
Artificial Intelligence Capability → Open Innovation → Business Performance	0.148	2.943	0.000	Confirmed	+

Discussion and Conclusion

The present study sought to identify and validate the components of managers' soft governance in government organizations and to develop an empirically supported factor structure for this construct. The findings demonstrated that soft governance is a multidimensional phenomenon comprising eight principal dimensions: perceived support, organizational justice, trust, participation, organizational learning, communication, ethical leadership, and humility. The qualitative phase initially identified a broader set of indicators, which were subsequently evaluated by experts through the Delphi process. Five indicators with mean scores below the predetermined criterion were eliminated, leaving 35 indicators for quantitative assessment. The subsequent first- and second-order confirmatory factor analyses provided empirical support for the proposed multidimensional structure. At the first-order level, the majority of questionnaire items demonstrated acceptable factor loadings and significant t-values, whereas items related to information sharing, rapid information, and several items within ethical leadership were removed because they did not meet the required measurement criteria. At the second-order level, all retained components demonstrated significant relationships with their corresponding higher-order dimensions. Composite reliability, Cronbach's alpha, and average variance extracted values provided evidence of satisfactory reliability and convergent validity. Moreover, the mean R^2 of 0.773 indicated substantial explanatory power, the mean Q^2 of 0.40 demonstrated predictive relevance, and the SRMR value of 0.02 supported the overall adequacy of the structural model. Collectively, these findings indicate that soft governance within government organizations can be meaningfully represented through a coherent combination of relational, ethical, informational, participatory, and learning-oriented managerial mechanisms.

The identification of these eight dimensions supports the broader conceptual argument that effective governance cannot be reduced to formal rules, coercive authority, and hierarchical control. Soft governance operates through less coercive but nevertheless influential mechanisms that shape organizational behavior through legitimacy, shared expectations, relationships, information, and voluntary commitment. This interpretation is consistent with the distinction between hard and soft governance emphasized in the governance literature. Soft arrangements may lack the binding force of formal rules, yet they can substantially influence behavior because organizational members perceive them as legitimate, appropriate, or normatively compelling [5, 6]. The present findings therefore reinforce the view that soft governance should not be interpreted as weak governance. Rather, it represents an alternative and complementary mode of coordination capable of producing meaningful organizational consequences. This interpretation also corresponds with the argument that soft law and nonbinding governance mechanisms have increasingly become important instruments of contemporary institutional coordination [4]. More recent analyses similarly indicate that complex organizations and large projects commonly depend on combinations of formal and informal governance mechanisms, with soft governance enabling flexibility, adaptation, and coordination where highly formalized mechanisms alone may prove insufficient [7]. The eight-dimensional model developed in the present study therefore provides an organizational-level representation of these broader governance principles.

Perceived support emerged as a central dimension of managers' soft governance and was represented by commitment, planning, actions, and evaluation. This finding suggests that employees' perceptions of managerial and organizational support are not formed exclusively through expressions of concern but also through observable managerial commitments, purposeful planning, concrete supportive actions, and continuous evaluation. Within a soft governance framework, perceived support can promote voluntary cooperation by signaling that employees are valued participants in organizational processes rather than merely subjects of hierarchical control. Such a mechanism can strengthen reciprocity and encourage employees to align their behavior with organizational objectives. This interpretation is consistent with the broader literature on organizational soft power, in which noncoercive influence is generated through attractive organizational practices, supportive human resource systems, and responsible relationships with organizational stakeholders [12]. Aromaa et al. likewise demonstrated that emotional and relational processes can function as forms of organizational soft power, showing that managerial influence is partly generated through affective and interpersonal experiences rather than formal authority alone [11]. The finding regarding perceived support therefore highlights the relational foundation of soft governance and suggests that managers' capacity to generate commitment may depend substantially on whether employees experience managerial practices as supportive and dependable.

Trust was another confirmed dimension and was represented by honesty, competence, consistency, and openness. The validation of these components indicates that trust in public-sector managers depends on both moral and performance-related judgments. Employees must not only perceive managers as honest but also regard them as competent, predictable in their behavior, and sufficiently open in organizational interactions. Trust is particularly important in soft governance because noncoercive coordination requires employees to accept managerial influence without constant monitoring or enforcement. Where trust is high, employees are more likely to share knowledge, cooperate across boundaries, and assume responsibility for organizational outcomes. The importance of trust is consistent with studies of knowledge governance, which demonstrate that effective knowledge sharing cannot be produced solely through technical systems or formal procedures; instead, it depends on governance arrangements that support interaction and voluntary exchange [14]. This is especially

relevant in public organizations, where interdepartmental knowledge sharing is influenced by organizational characteristics, coordination mechanisms, and relational conditions [15]. The current results are also compatible with research showing that knowledge governance mechanisms influence organizational and project performance by shaping how organizational members exchange and utilize knowledge [16]. Accordingly, trust may be understood as a foundational condition through which other soft governance mechanisms become operational.

Organizational justice was confirmed through procedural, distributive, and interactional justice, indicating that employees' perceptions of fairness constitute another important basis of soft governance. This result is theoretically significant because the legitimacy of managerial influence is likely to depend on whether employees believe that decisions are made through fair procedures, outcomes are allocated fairly, and interpersonal interactions are respectful and appropriate. Soft governance relies less on coercion than traditional command-based administration and therefore requires stronger perceptions of legitimacy. Fairness can provide this legitimacy by making managerial decisions more acceptable even when those decisions do not fully correspond with individual preferences. The strong role of justice in the proposed model can also be interpreted alongside contemporary governance approaches that emphasize consensus, legitimacy, and acceptance rather than unilateral control. Studies of soft governance in European institutional settings show that coordination can be achieved through processes of consensus formation, mutual adjustment, and shared expectations rather than direct legal compulsion [8, 9]. Similar arguments have been made in studies of soft governance in learning environments, where institutional influence is exercised through standards, comparison, communication, and socially accepted frameworks [10]. The present findings extend these ideas to the organizational level by suggesting that perceptions of justice are among the mechanisms through which managers obtain legitimate acceptance of their influence.

Participation also emerged as an important dimension, with consultation, joint decision-making, self-management, and acceptance of responsibility receiving empirical support. Information sharing, however, was eliminated during first-order factor analysis because its two associated items failed to meet the required statistical criteria. The retained participation structure suggests that soft governance involves more than providing employees with information; rather, employees must be given meaningful opportunities to contribute to decision-making, exercise autonomy, and accept responsibility for outcomes. This distinction is important because passive access to information does not necessarily constitute genuine participation. The findings imply that participatory governance becomes meaningful when employees can influence decisions and assume an active role in organizational processes. This interpretation is aligned with contemporary approaches that conceptualize governance as increasingly adaptive, participatory, and network-oriented [21]. It also corresponds with empowerment-oriented leadership perspectives, which emphasize that effective leaders create conditions in which organizational members can exercise agency, develop capabilities, and accept greater responsibility [18]. Recent theoretical work on dual-purpose organizations similarly suggests that soft governance is particularly useful where managers must coordinate multiple goals and heterogeneous interests without relying excessively on rigid hierarchical mechanisms [24]. Participation may therefore function as a mechanism through which employees become active contributors to governance rather than merely recipients of administrative decisions.

The confirmation of organizational learning as a dimension of soft governance further demonstrates that contemporary governance is inseparable from organizational knowledge processes. The retained components included clarity of mission and goals, empowerment, knowledge transfer, and teamwork and group problem-solving, while experimentation was

removed during the expert-validation stage. These findings suggest that organizational learning in public-sector soft governance is primarily associated with shared direction, employee empowerment, systematic knowledge exchange, and collective problem-solving. Knowledge governance research provides strong conceptual support for this finding. Foss et al. emphasized that knowledge sharing requires specific governance mechanisms at multiple levels of analysis and that organizational arrangements can either facilitate or inhibit the willingness and ability of employees to exchange knowledge [14]. Similarly, Feizollahi et al. conceptualized organizational knowledge governance from a systems perspective, indicating that knowledge processes must be considered as interconnected components rather than isolated activities [17]. Research in public organizations has also shown that organizational structures and characteristics influence interdepartmental knowledge exchange [15]. Thus, organizational learning represents a particularly important soft governance mechanism because learning depends largely on cooperation, openness, empowerment, and collective interpretation rather than direct administrative control.

Communication was confirmed through timely information, accurate information, complete information, and feedback, whereas rapid information was removed because its associated items failed to demonstrate adequate measurement properties. This pattern is noteworthy because it suggests that communication effectiveness in soft governance depends more on informational quality and responsiveness than on speed alone. Timely information is conceptually different from merely rapid information: timely communication implies that information is delivered when it is useful and relevant for decision-making, while speed without accuracy or completeness may not enhance governance quality. The retained communication components therefore emphasize reliability, adequacy, and feedback. This interpretation is compatible with contemporary governance developments in which openness and information accessibility have become critical mechanisms of accountability and stakeholder engagement. Research on government open-data platforms has demonstrated that greater information openness can influence organizational behavior and corporate sustainability-related outcomes by enhancing transparency and external scrutiny [22]. Bell similarly emphasized the role of openness and knowledge accessibility as forms of soft power capable of shaping relationships and institutional influence [13]. Furthermore, the growing use of soft-law mechanisms in fields characterized by rapid technological change, such as artificial intelligence governance, illustrates how principles, guidance, information exchange, and voluntary standards can coordinate behavior where rigid regulation may not adapt sufficiently quickly [23]. Communication therefore appears to function as both an independent dimension of soft governance and an enabling mechanism for the operation of other dimensions.

Ethical leadership was another central dimension, incorporating people orientation, fairness, power sharing, concern for sustainability, ethical guidance, and role clarification. Although several individual items within people orientation, fairness, and ethical guidance were eliminated at the first-order level, the corresponding constructs remained statistically supported by their retained indicators and demonstrated significant second-order loadings. This finding highlights the multidimensional character of ethical managerial influence. Soft governance depends not only on managers' technical competence but also on whether they demonstrate concern for people, distribute power responsibly, behave fairly, provide ethical direction, and clarify employees' responsibilities. Ethical leadership may be especially influential in government organizations because public managers must reconcile organizational performance requirements with public values, accountability, and expectations of integrity. Research on leadership has emphasized the importance of cultural and social contexts in shaping effective leadership practices and the legitimacy of managerial influence [19]. Likewise, studies of servant and empowering

leadership highlight mentorship and empowerment as mechanisms through which leaders can stimulate stronger organizational contributions [18]. The present results also correspond with evidence that employees' emotional and relational capabilities influence organizational citizenship behavior and job performance, indicating that effective managerial relationships involve social and emotional processes that extend beyond formal job requirements [20]. Ethical leadership can consequently be viewed as a major behavioral channel through which soft governance is enacted.

Humility was validated through willingness to engage in self-review, appreciation of others' strengths, appreciation of subordinates' contributions, and openness to new ideas and feedback. The initial indicator of willingness to learn was eliminated during the expert-validation stage, yet the retained components collectively indicate a strong learning-oriented and relational character. Managerial humility may be especially relevant to soft governance because it reduces the social distance created by hierarchy and signals that authority does not imply infallibility. Managers who acknowledge the strengths and contributions of employees and remain receptive to feedback can facilitate upward communication, knowledge exchange, participation, and psychological ownership. This interpretation also helps explain why humility is conceptually linked to organizational learning, trust, and ethical leadership within the broader model. The growing emphasis on soft technologies in governance reflects a similar recognition that managerial effectiveness depends on behavioral and relational mechanisms in addition to formal institutional structures [2]. The conceptualization of governmental soft power likewise emphasizes influence generated through attraction, legitimacy, cooperation, and noncoercive capacities [3]. In this sense, humility should not be interpreted as managerial weakness; rather, it can increase influence by enhancing openness and interpersonal credibility.

At the model level, the strong reliability, validity, explanatory power, predictive relevance, and structural fit indices provide support for treating soft governance as a higher-order organizational construct rather than as a collection of unrelated managerial practices. The mean R^2 value of 0.773 suggests that the proposed model possesses substantial explanatory capacity, while the Q^2 value of 0.40 confirms meaningful predictive relevance. The SRMR value of 0.02 further indicates a very satisfactory structural fit. These findings reinforce the argument that soft governance involves an integrated configuration of relational and organizational mechanisms. The results are consistent with Torabi's conceptualization of soft governance as a meaningful governance approach and with studies emphasizing the role of soft technologies in enhancing governance effectiveness [1, 2]. They also support the broader proposition that the distinction between hard and soft governance should not be understood as a choice between mutually exclusive alternatives. Rather, soft mechanisms may complement formal structures and enhance their adaptability, legitimacy, and effectiveness [5, 7]. This integrative interpretation is particularly important in public administration, where formal authority remains essential but is increasingly insufficient for managing knowledge-intensive, interconnected, and rapidly changing organizational environments.

Overall, the findings contribute to the existing literature by translating the broad concept of soft governance into a measurable managerial model specifically applicable to government organizations. Previous studies have examined soft governance primarily in the contexts of unofficial guidelines, European governance, soft law, policy coordination, knowledge governance, emerging technologies, and organizational soft power [4, 6, 8, 13]. The present model integrates these disparate perspectives at the organizational level and suggests that managers' soft governance is expressed through a combination of support, fairness, trust, participation, learning, communication, ethics, and humility. Such an interpretation is also compatible with the increasing importance of flexible governance systems capable of coordinating actors under conditions of multiple

objectives and complex stakeholder relationships [24]. The model therefore contributes by showing that noncoercive governance in government organizations is not an abstract managerial orientation but a structured set of observable and measurable practices. The validated dimensions provide a conceptual basis for assessing how public managers generate voluntary cooperation, improve knowledge exchange, reinforce legitimacy, and complement formal administrative mechanisms.

The present study is subject to several limitations that should be considered when interpreting its findings. First, the quantitative data were collected through a self-report questionnaire, which may be affected by respondents' subjective perceptions, social desirability, or response tendencies despite the statistical assessment of common method bias. Second, convenience sampling was used in the quantitative phase, which limits the extent to which the findings can be generalized to all government organizations and administrative contexts. Third, the cross-sectional design captures employees' perceptions at a single point in time and therefore cannot demonstrate how soft governance develops or changes over time. Fourth, the proposed model was examined within government organizations in one national and institutional context; consequently, cultural, political, administrative, and organizational characteristics may have influenced the relative importance of its components. Finally, although the model demonstrated satisfactory measurement and structural properties, the study primarily examined the internal structure of soft governance rather than its causal effects on organizational outcomes such as performance, innovation, organizational commitment, employee well-being, or public-service quality.

Future studies should replicate the proposed model using probability sampling and larger samples drawn from different government sectors, administrative levels, regions, and national contexts to assess its generalizability and measurement invariance. Longitudinal designs could examine whether soft governance practices remain stable over time and whether changes in managerial behavior produce corresponding changes in employee attitudes and organizational outcomes. Researchers could also compare public, private, nonprofit, and hybrid organizations to determine whether the relative importance of the eight dimensions varies across institutional environments. Further studies should test antecedents and consequences of soft governance by examining variables such as organizational culture, administrative structure, digitalization, managerial competence, innovation, employee engagement, organizational citizenship behavior, knowledge sharing, service quality, and organizational performance. Multilevel designs may also distinguish manager-level, team-level, and organizational-level effects. Finally, qualitative research could explore why particular indicators, such as information sharing, rapid information, experimentation, and willingness to learn, were not retained in the present model and whether their relevance changes across different organizational conditions.

Government organizations can use the validated dimensions of soft governance as a diagnostic framework for managerial development and organizational improvement. Managers should strengthen perceived support through credible commitments, systematic planning, visible supportive actions, and continuous evaluation; build trust through honesty, competence, consistency, and openness; and enhance organizational justice by ensuring fair procedures, equitable outcomes, and respectful interpersonal treatment. Participation should be encouraged through consultation, joint decision-making, self-management, and meaningful responsibility rather than symbolic involvement. Organizations should also invest in timely and accurate communication, feedback systems, knowledge transfer, teamwork, and empowerment. Leadership-development programs should explicitly address ethical guidance, fairness, responsible power sharing, role clarification, and

concern for people and organizational sustainability. Finally, humility should be treated as a managerial capability by encouraging leaders to review their own assumptions, recognize employees' strengths, acknowledge subordinate contributions, and remain receptive to new ideas and feedback. Taken together, these practices can complement formal administrative controls and create a governance environment based on legitimacy, cooperation, learning, responsibility, and voluntary commitment.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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