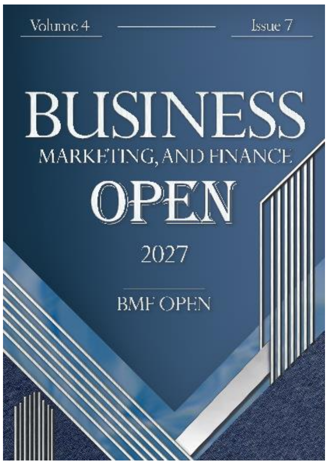
Dual Continuity Leadership: Sustaining Information Systems and Business Continuity for Innovation and Resilience in High-Tech Firms

Amir Moslemi [1,*]



Citation: Moslemi, A. (2027). Dual Continuity Leadership: Sustaining Information Systems and Business Continuity for Innovation and Resilience in High-Tech Firms. *Business, Marketing, and Finance Open*, 4(7), 1-19.

Received: 09 June 2026
Revised: 26 August 2026
Accepted: 02 September 2026
Initial Publication: 06 September 2026
Final Publication: 01 December 2027

[1] Department of Industrial Engineering, WT.C., Islamic Azad University, Tehran, Iran;

* Correspondence: amir.moslemi@iau.ac.ir

Abstract: This study aimed to examine the direct and indirect effects of dual continuity leadership on organizational innovation and organizational resilience through information systems continuity and business continuity in high-tech firms. This quantitative, applied, cross-sectional study used a descriptive-correlational and explanatory design. The statistical population consisted of managers, supervisors, information technology specialists, research and development employees, and professional staff working in high-tech firms in Tehran, Iran. A total of 384 participants were included through a multistage sampling procedure. Data were collected using a structured questionnaire assessing dual continuity leadership, information systems continuity, business continuity, organizational innovation, and organizational resilience. Construct validity was examined through confirmatory factor analysis, while reliability was assessed using Cronbach's alpha and composite reliability. Data analysis included descriptive statistics, Pearson correlations, confirmatory factor analysis, and structural equation modeling. Indirect effects were assessed using bootstrapping with bias-corrected confidence intervals. Dual continuity leadership significantly predicted information systems continuity ($\beta = 0.62$, $p < .001$) and business continuity ($\beta = 0.59$, $p < .001$). Information systems continuity significantly predicted organizational innovation ($\beta = 0.31$, $p < .001$) and organizational resilience ($\beta = 0.26$, $p < .001$), while business continuity significantly predicted organizational innovation ($\beta = 0.22$, $p = .001$) and organizational resilience ($\beta = 0.42$, $p < .001$). Dual continuity leadership also had significant direct effects on organizational innovation ($\beta = 0.21$, $p = .001$) and organizational resilience ($\beta = 0.19$, $p = .002$). Bootstrapping confirmed significant indirect effects through both continuity mechanisms, supporting partial mediation. The model explained 42.7% of the variance in organizational innovation and 51.6% of the variance in organizational resilience. Dual continuity leadership appears to strengthen innovation and resilience in high-tech firms by simultaneously sustaining critical information systems and essential business processes, indicating that integrated continuity-oriented leadership can function as both a protective and adaptive strategic capability.

Keywords: Dual Continuity Leadership; Information Systems Continuity; Business Continuity; Organizational Innovation; Organizational Resilience; High-Tech Firms

1. Introduction

High-tech firms operate in environments characterized by rapid technological change, compressed innovation cycles, intense competitive pressure, growing dependence on digital infrastructures, and increasing exposure to operational, cyber, supply-chain, and environmental disruptions. In such contexts, organizational performance depends not only on the ability to innovate but also on the capacity to sustain critical technological and business functions when disruption occurs. Continuity has therefore moved from being a narrowly technical or emergencyoriented concern to becoming a strategic organizational capability. High-tech firms are especially sensitive to failures in information systems because their core processes, knowledge flows, customer interactions, innovation activities, and decision-making routines are deeply embedded in digital platforms and data infrastructures. At the same time, maintaining technological systems alone is insufficient if essential business processes, leadership structures, human resources, and cross-functional coordination cannot continue under adverse conditions. Contemporary organizations thus require an integrated approach in which information systems continuity and business continuity are treated as mutually reinforcing dimensions of organizational survival, adaptability, and long-term competitiveness. This broader perspective is consistent with recent attempts to conceptualize continuity management as a strategic, anticipatory, and ecosystem-oriented function rather than merely a reactive response to crisis [1-3].

Business continuity management has traditionally focused on identifying critical processes, assessing the consequences of operational disruption, developing recovery priorities, and ensuring that essential activities can be maintained or restored within acceptable timeframes. The business impact analysis framework proposed by Torabi et al. highlights the importance of systematically identifying process criticality, dependencies, recovery priorities, and potential losses as foundations of effective continuity planning [4]. However, the increasing digitalization of firms has expanded the scope of business continuity because organizational processes are now inseparable from information systems, cloud services, digital platforms, communication technologies, databases, and interconnected technological infrastructures. Consequently, the continuity of business functions increasingly depends on the ability of organizations to preserve or rapidly recover critical information systems. Integrating information technology disaster recovery with broader business continuity planning has therefore become essential to organizational resilience, particularly in environments in which technological interruption can rapidly cascade across operational units and stakeholder networks [5]. In digital ecosystems, continuity must be understood as a coordinated capability spanning technology, operations, people, governance, and interorganizational dependencies [3]. This integrated view is especially relevant to high-tech firms, where even short periods of technological or operational interruption may jeopardize innovation projects, customer trust, intellectual assets, and market responsiveness.

Information systems continuity refers to the organizational capability to sustain, restore, and adapt critical digital resources and services in the face of disruption. This capability extends beyond technical backup and disaster recovery and includes system reliability, information availability, infrastructure redundancy, cybersecurity preparedness, data recovery, technological adaptability, and the sustained use of information systems over time. Research on information systems continuance has historically emphasized the factors that encourage users and organizations to maintain engagement with digital systems. Venkatesh et al. demonstrated that continuance cannot be adequately explained by initial technology acceptance alone and that contextual and post-adoption factors shape continued system use [6]. Similarly, research on technology adoption and acceptance has emphasized that the long-term value of information systems depends on behavioral, technological, organizational, and contextual determinants that extend beyond initial implementation [7]. Continuance research in specific digital contexts has also shown that satisfaction, perceived value, system quality, and contextual influences shape sustained engagement with information technologies [8-10]. In organizational settings, such insights suggest that information system sustainment is not simply a technical issue but a multidimensional organizational process involving infrastructure, users, management, governance, and ongoing adaptation. Recent work on information system sustainment similarly emphasizes the importance of factors that enable organizations to maintain the functionality and strategic contribution of information systems over time [11].

The importance of information systems continuity becomes even more evident when considered in relation to organizational resilience. Organizational resilience refers to the capacity of an organization to anticipate potential threats, absorb shocks, adapt to changing conditions, recover from adversity, and, in some cases, emerge from disruption with enhanced capabilities. Duchek conceptualized resilience as a capability-based process involving anticipation, coping, and adaptation, thereby framing resilience as a dynamic organizational competence rather than a static organizational trait [12]. From this perspective, resilient organizations are not merely those that return to a pre-disruption state but those that learn, reconfigure resources, and adjust structures and routines in response to changing environmental demands. Earlier work similarly emphasized that organizational resilience can be developed through strategic resources, human capabilities, cognitive readiness, behavioral flexibility, and supportive organizational systems [13]. In digital enterprises, information technology capabilities have become increasingly important contributors to resilience because they facilitate information access, communication, coordination, resource integration, and rapid response to uncertainty [14]. Accordingly, high-tech firms that possess stronger information systems continuity capabilities may be better equipped to absorb disruption while maintaining access to the information, knowledge, and digital resources required for adaptation.

Business continuity and organizational resilience are closely related but conceptually distinct. Business continuity is generally concerned with preserving or restoring critical functions during and after disruption, whereas resilience encompasses a broader organizational capacity to anticipate, adapt, transform, and learn. Herbane argued that business continuity should be reconsidered within a broader resilience perspective because continuity practices can contribute to adaptive capacity rather than functioning solely as recovery mechanisms [15]. Likewise, contemporary strategic discussions distinguish continuity from resilience while emphasizing their complementarity: continuity concerns the maintenance of essential operations, whereas resilience concerns the ability to absorb change, adapt, and continue creating value despite uncertainty [16]. This distinction is highly important in high-tech firms because operational continuity may protect the organization from immediate failure, but resilience determines whether the organization can adjust to technological discontinuities, market shocks, cyber incidents, regulatory change, or emerging competitive threats. A firm may restore its systems and operations after a disruption yet remain strategically vulnerable if it cannot learn and adapt. Therefore, continuity capabilities should be viewed as foundational mechanisms that support, but do not entirely constitute, resilience.

Leadership is central to the development and coordination of these capabilities. Continuity planning depends on decisions regarding priorities, resource allocation, technological investment, responsibility structures, communication, succession, preparedness, and cross-functional coordination. Leadership also shapes whether continuity is treated as a peripheral compliance function or embedded within strategic management. Research on leadership continuity further demonstrates that organizational sustainability depends partly on the preservation of leadership knowledge, succession processes, and institutional memory. Strategic succession planning can protect organizations from leadership disruptions and support sustained organizational success by preparing future leaders and reducing dependence on particular individuals [17]. Recent research has similarly emphasized the value of integrating succession planning, leadership development, and organizational memory in order to ensure leadership continuity across periods of transition [18]. Evaluating leadership strategies and systematically preparing future leaders can further strengthen the organization’s capacity to maintain strategic direction and decision-making continuity [19]. These insights suggest that continuity itself has a leadership dimension: sustaining operations and systems requires leaders capable of preserving strategic coherence, institutional knowledge, and coordinated action before, during, and after disruption.

However, leadership in high-tech firms must accomplish more than maintaining stability. It must also facilitate innovation. Innovation often requires experimentation, flexibility, risk-taking, and openness to new ideas, whereas continuity emphasizes reliability, control, preparedness, and the protection of critical functions. These demands may appear contradictory, yet effective leadership in technology-intensive environments must balance them simultaneously. The concept of ambidextrous leadership offers an important foundation for understanding this challenge. Rosing et al. proposed that leaders facilitate innovation by flexibly alternating between opening behaviors that encourage exploration and closing behaviors that promote implementation, coordination, and goal attainment [20]. This perspective demonstrates that effective leadership does not necessarily involve choosing between flexibility and control; rather, it involves managing apparently competing demands according to situational requirements. Similarly, broader leadership research indicates that leadership effectiveness depends on relational, developmental, ethical, and supportive behaviors that can strengthen employee engagement, trust, and organizational functioning [21]. These leadership perspectives provide a useful theoretical basis for considering whether leaders can simultaneously strengthen continuity-oriented control and innovation-oriented adaptability.

The present study develops this reasoning through the concept of dual continuity leadership. Dual continuity leadership refers to a leadership capability through which organizational leaders simultaneously promote information systems continuity and business continuity while aligning both with strategic adaptation, innovation, and organizational resilience. The concept differs from conventional business continuity leadership because it explicitly recognizes two interconnected continuity domains. The first is technological continuity, which concerns the availability, recoverability, reliability, and adaptability of information systems and digital infrastructures. The second is business continuity, which concerns the maintenance and recovery of essential organizational processes, operational capabilities, decision structures, and stakeholder services. In high-tech firms, these domains are deeply interdependent. Information systems cannot create organizational value if business processes are unable to function, while business processes cannot be sustained when critical technologies, digital platforms, or data resources fail. Dual continuity leadership therefore represents the leadership capacity to integrate these two domains through strategic alignment, preparedness, resource coordination, communication, risk awareness, and adaptive decision-making.

This integrated leadership perspective also provides a potential explanation for how continuity may contribute to innovation rather than merely constraining it. Continuity is sometimes associated with standardization, risk reduction, and preservation of existing operations, whereas innovation is associated with disruption, novelty, and experimentation. Nevertheless, reliable information systems and stable critical processes can create the organizational slack, confidence, and infrastructure necessary for experimentation. When employees trust that key systems, data, communication channels, and operational functions will remain available or recover rapidly, they may be better positioned to pursue new ideas without exposing the organization to unacceptable systemic risk. Information systems continuity can therefore provide a technological foundation for innovation by protecting access to digital tools, knowledge repositories, collaborative platforms, and analytical capabilities. Business continuity can provide a corresponding operational foundation by ensuring that essential activities remain sufficiently stable to support experimentation and implementation. In this sense, continuity may function as an enabling condition for innovation rather than its opposite.

The same logic applies to resilience. Continuity capabilities can support resilience by preserving critical resources during disruption and shortening the time required to restore organizational functioning. However, resilience requires more than recovery; it also requires learning and adaptation. This is why leadership is particularly important. Leaders can transform continuity routines from static emergency plans into dynamic learning systems by encouraging scenario planning, post-event learning, cross-functional knowledge exchange, technological preparedness, and adaptive resource reconfiguration. The capability-based view of resilience suggests that organizations become resilient through combinations of anticipatory, coping, and adaptive capabilities [12]. Business continuity planning can directly reinforce anticipation and coping, while information systems continuity can strengthen situational awareness, communication, and access to critical information. Leadership can integrate these capabilities and translate them into broader adaptive outcomes. Accordingly, dual continuity leadership may influence resilience both directly, through strategic and relational processes, and indirectly, through the development of stronger technological and operational continuity capabilities.

Despite growing research on business continuity, organizational resilience, information systems continuance, leadership, and innovation, these streams have largely developed in parallel. Business continuity research has concentrated on planning frameworks, business impact analysis, risk assessment, disaster recovery, and continuity program design [2, 4]. Information systems continuance research has primarily examined user satisfaction, adoption, post-adoption behavior, and sustained technology use [6, 22]. For example, Cheng demonstrated that satisfaction and relevant system-related drivers play important roles in continuance intention toward cloud-based hospital information systems, reinforcing the importance of post-adoption conditions in maintaining ongoing system use [22]. Meanwhile, resilience studies have focused on adaptive capabilities, strategic resources, human capital, and organizational responses to disruption [13, 15]. Leadership research has examined innovation-oriented, servant, ambidextrous, and succession-related leadership, but has rarely integrated leadership with both technological and business continuity in a single explanatory framework [17, 20, 21]. This fragmentation limits understanding of how leaders in highly digital organizations coordinate continuity across technical and operational domains and how such coordination contributes to innovation and resilience.

This gap is particularly consequential for high-tech firms. Their competitiveness depends on innovation, but their innovation processes are themselves dependent on continuous access to technological infrastructure, knowledge, specialist expertise, and coordinated business processes. Disruption can therefore have dual consequences: it can interrupt current operations while simultaneously undermining future innovation capacity. At the same time, excessive emphasis on stability and control may reduce experimentation and adaptability. High-tech firms consequently require a leadership approach capable of protecting essential systems and processes without suppressing innovative behavior. Horizon-oriented continuity research increasingly recognizes that business continuity must respond to evolving and emerging risks rather than rely solely on retrospective crisis planning [1]. Likewise, strategic continuity frameworks emphasize the need to integrate continuity with organizational strategy, governance, and long-term resilience [2]. Bringing these perspectives together suggests that leadership may represent the coordinating mechanism through which information systems continuity and business continuity become strategic capabilities that support both innovation and resilience.

Therefore, the aim of this study was to examine the direct and indirect effects of dual continuity leadership on organizational innovation and organizational resilience through information systems continuity and business continuity in high-tech firms.

2. Methodology

This study employed a quantitative, applied, cross-sectional research design with a descriptive-correlational and explanatory approach to investigate the role of dual continuity leadership in simultaneously sustaining information systems and business continuity and to determine its implications for organizational innovation and resilience in high-tech firms. The conceptual premise of the study was that contemporary technology-intensive organizations require leadership capabilities that integrate the continuity of digital and information infrastructures with the continuity of critical business processes, particularly under conditions characterized by technological disruption, environmental uncertainty, cyber-related risks, and rapidly changing market requirements. Accordingly, the study examined the relationships among dual continuity leadership, information systems continuity, business continuity, organizational innovation, and organizational resilience within a unified empirical framework. The statistical population consisted of managers, supervisors, information technology specialists, business continuity personnel, research and development employees, and professional staff employed in high-tech firms located in Tehran, Iran. High-tech firms were defined as organizations whose principal activities were substantially dependent on advanced technological knowledge, digital infrastructures, innovation-intensive processes, research and development activities, or technology-based products and services. These firms included organizations operating in areas such as information and communication technology, software development, digital services, electronics, advanced engineering, technology-based manufacturing, and other knowledge-intensive industries.

A total of 384 participants were included in the final sample. The sample size was considered adequate for multivariate statistical analysis and structural equation modeling because it provided sufficient statistical power for estimating the proposed relationships among the latent constructs while also reducing the likelihood of unstable parameter estimates. Participants were selected through a multistage sampling procedure. First, eligible high-tech firms operating in Tehran were identified according to their technology orientation, dependence on information systems, and involvement in innovation-intensive activities. Subsequently, a number of firms were selected from the eligible organizational population, and employees and managers who met the inclusion criteria were approached within the selected organizations. To be eligible for participation, respondents were required to have at least one year of organizational work experience, be employed in a managerial, technical, professional, information technology, operational, research and development, or continuity-related position, and possess sufficient familiarity with the organization's information systems, operational processes, innovation activities, or responses to disruptions. Individuals with less than one year of experience in the organization and questionnaires containing substantial missing information were excluded from the final analysis. Participation was voluntary, and respondents were informed about the purpose of the research, confidentiality of their responses, anonymity of the collected information, and their right to withdraw from the study without any organizational or personal consequences. The unit of analysis was the individual employee or manager, while the questionnaire items were formulated to capture respondents' perceptions of organizational leadership and organizational-level capabilities.

Data were collected using a structured self-report questionnaire composed of two major sections. The first section gathered demographic and professional information, including age, gender, educational level, organizational position, work experience, organizational tenure, and the principal technological or industrial field of the employing firm. The second section assessed the principal constructs of the conceptual model, namely dual continuity leadership, information systems continuity, business continuity, organizational innovation, and organizational resilience. All substantive items were measured using a five-point Likert-type response scale ranging from 1, representing “strongly disagree,” to 5, representing “strongly agree.” The questionnaire was designed so that higher scores represented stronger perceptions of the corresponding organizational capability. Dual continuity leadership was operationalized as an integrative leadership capability through which organizational leaders simultaneously support the continuity, recoverability, adaptability, and strategic alignment of information systems and essential business operations. Items related to this construct assessed leadership commitment to continuity preparedness, coordination between technological and business functions, allocation of resources for continuity, anticipatory risk management, cross-functional communication, rapid decision-making during disruption, continuity-oriented learning, and the integration of technological recovery priorities with strategic and operational requirements.

Information systems continuity was assessed through items addressing the organization’s capability to maintain, recover, and adapt critical digital and information resources during and following disruptive events. The measurement domain encompassed the availability and reliability of critical information systems, data protection and recovery, backup arrangements, technological redundancy, disaster recovery preparedness, system restoration capability, cyber-related continuity measures, and the capacity to preserve access to essential information and digital services. Business continuity was measured as the organization’s capability to sustain or rapidly restore critical organizational processes under disruptive conditions. The corresponding items assessed continuity planning, identification of critical processes, emergency preparedness, alternative operating arrangements, allocation of continuity responsibilities, coordination across organizational units, response capability, operational recovery, and periodic review of continuity procedures. Organizational innovation was measured in terms of the organization’s ability to generate, adopt, implement, and commercialize new ideas, technologies, services, products, and processes. Items therefore reflected support for experimentation, adoption of new technologies, implementation of novel work processes, responsiveness to emerging opportunities, development of new products or services, and organizational willingness to transform existing practices. Organizational resilience was assessed as the organization’s capacity to anticipate threats, absorb disruptions, adapt to changing circumstances, recover effectively, and preserve or improve essential functioning following adverse events. The resilience items covered preparedness, adaptive capacity, flexibility, rapid recovery, resource reconfiguration, organizational learning, effective responses to unexpected events, and the ability to maintain essential performance under conditions of uncertainty.

To ensure adequate content validity, the preliminary questionnaire was reviewed by a panel of academic and professional experts with expertise in information systems management, business continuity, strategic management, organizational behavior, innovation management, and high-technology organizations. The experts evaluated the relevance, clarity, comprehensiveness, and conceptual appropriateness of the items. Their comments were incorporated into the wording and organization of the questionnaire before final administration. A pilot administration was subsequently conducted with a small group of respondents possessing characteristics similar to those of the target population to assess comprehensibility, completion time, and preliminary reliability. Construct validity was evaluated in the main study through confirmatory factor analysis. Convergent validity was assessed on the basis of standardized factor loadings and average variance extracted, whereas discriminant validity was examined to determine whether the latent constructs represented empirically distinguishable dimensions. Internal consistency reliability was evaluated using Cronbach’s alpha and composite reliability coefficients. Values of 0.70 or higher were regarded as indicating satisfactory reliability, while an average variance extracted value of approximately 0.50 or higher was considered evidence of acceptable convergent validity. Questionnaire administration was conducted in a manner that protected respondent anonymity and minimized direct organizational pressure, thereby reducing the possibility of socially desirable responding and improving the independence of individual responses.

The collected data were analyzed using a sequential statistical procedure comprising preliminary data screening, descriptive statistics, measurement-model assessment, and structural-model testing. Initially, all questionnaires were reviewed for completeness, and the data were screened for coding errors, missing observations, univariate and multivariate outliers, and response patterns that could compromise data quality. Descriptive statistics, including frequencies and percentages for categorical variables and means and standard deviations for continuous variables and study constructs, were calculated to characterize the participants and summarize the distribution of the principal variables. Before conducting multivariate analyses, the statistical assumptions relevant to the selected analytical procedures were evaluated. Distributional characteristics were examined using skewness and kurtosis indices, while potential multicollinearity among predictor variables was assessed using tolerance and variance inflation factor statistics. Correlation analysis was subsequently performed to determine the direction and magnitude of the bivariate relationships among dual continuity leadership, information systems continuity, business continuity, organizational innovation, and organizational resilience.

The hypothesized research model was evaluated through structural equation modeling. Before testing the structural relationships, confirmatory factor analysis was conducted to assess the adequacy of the measurement model and to verify whether the observed indicators adequately represented their respective latent constructs. Standardized factor loadings, internal consistency coefficients, composite reliability, average variance extracted, and indicators of discriminant validity were examined as part of this process. Overall model adequacy was evaluated using multiple goodness-of-fit indices rather than relying on a single statistic. These indices included the chi-square to degrees-of-freedom ratio, comparative fit index, Tucker–Lewis index, incremental fit index, goodness-of-fit index, and root mean square error of approximation. Values generally consistent with established thresholds for acceptable model fit were interpreted as evidence that the proposed measurement and structural models corresponded adequately with the empirical data.

Following confirmation of the measurement model, the structural model was estimated to examine the direct and indirect relationships proposed in the study. Particular attention was given to the effects of dual continuity leadership on information systems continuity and business continuity, as well as the subsequent effects of these continuity capabilities on organizational innovation and organizational resilience. The analysis also examined whether information systems continuity and business continuity functioned as explanatory mechanisms through which dual continuity leadership contributed to innovation and resilience. Standardized path coefficients, standard errors, critical ratios or corresponding test statistics, and probability values were used to assess the magnitude and statistical significance of the hypothesized direct effects. Indirect effects were evaluated using a bootstrapping procedure with repeated resampling, and bias-corrected confidence intervals were calculated to assess the statistical significance of the mediation pathways. An indirect effect was considered statistically significant when its confidence interval did not include zero. The coefficient of determination for each endogenous construct was also examined to determine the proportion of variance explained by the model. All statistical tests were conducted using a two-tailed significance criterion of $p < .05$. This analytical strategy enabled simultaneous evaluation of the measurement quality of the study constructs and the interconnected leadership, technological continuity, business continuity, innovation, and resilience relationships proposed in the conceptual model.

3. Findings and Results

A total of 384 valid questionnaires were included in the final statistical analysis. Of the participants, 236 respondents (61.5%) were male and 148 respondents (38.5%) were female. In terms of age, 69 participants (18.0%) were younger than 30 years, 156 participants (40.6%) were between 30 and 39 years of age, 111 participants (28.9%) were between 40 and 49 years of age, and 48 participants (12.5%) were 50 years of age or older. Regarding educational attainment, 42 respondents (10.9%) held an associate degree or lower qualification, 151 respondents (39.3%) held a bachelor's degree, 148 respondents (38.5%) held a master's degree, and 43 respondents (11.2%) held a doctoral degree. With respect to organizational position, 82 participants (21.4%) occupied managerial or supervisory positions, 119 participants (31.0%) were information technology, information systems, or technical specialists, 73 participants (19.0%) worked in research and development or innovation-related positions, and 110 participants (28.6%) were employed in other professional or operational positions. Participants had substantial organizational experience, with 76 respondents (19.8%) reporting between 1 and 5 years of work experience, 131 respondents (34.1%) reporting between 6 and 10 years, 108 respondents (28.1%) reporting between 11 and 15 years, and 69 respondents (18.0%) reporting more than 15 years of professional experience. Overall, the demographic profile indicated that the sample included employees and managers with diverse organizational roles, educational backgrounds, and levels of professional experience, thereby providing an appropriate empirical basis for evaluating leadership, continuity, innovation, and resilience in high-tech firms.

Table 1. Descriptive Statistics, Distributional Characteristics, and Multicollinearity Diagnostics for the Study Variables

Variable	Mean	SD	Skewness	Kurtosis	Tolerance	VIF
Dual Continuity Leadership	3.74	0.64	-0.41	0.28	0.57	1.75
Information Systems Continuity	3.68	0.66	-0.36	0.19	0.61	1.64
Business Continuity	3.62	0.69	-0.29	-0.08	0.59	1.69
Organizational Innovation	3.71	0.67	-0.33	0.14	0.66	1.52
Organizational Resilience	3.76	0.65	-0.38	0.21	0.63	1.59

As presented in Table 1, the mean scores of all principal study variables were above the theoretical midpoint of the five-point measurement scale, indicating relatively favorable perceptions of continuity-oriented leadership, technological and operational continuity capabilities, innovation, and resilience among employees and managers of the investigated high-tech firms. Organizational resilience obtained the highest mean score ($M = 3.76$, $SD = 0.65$), followed closely by dual continuity leadership ($M = 3.74$, $SD = 0.64$) and organizational innovation ($M = 3.71$, $SD = 0.67$). Information systems continuity had a mean of 3.68 ($SD = 0.66$), while business continuity showed the comparatively lowest, although still above-midpoint, mean score of 3.62 ($SD = 0.69$). The relatively similar standard deviations indicated that the variability of respondents' perceptions was comparable across the five constructs. Examination of skewness and kurtosis further showed that all variables fell within acceptable limits for multivariate analysis. Skewness coefficients ranged from -0.41 to -0.29, whereas kurtosis coefficients ranged from -0.08 to 0.28, providing no indication of substantial departure from normality. The multicollinearity diagnostics were also satisfactory. Tolerance values ranged between 0.57 and 0.66, considerably above the commonly accepted minimum threshold, while variance inflation factor values ranged from 1.52 to 1.75, substantially below levels indicating problematic multicollinearity. These findings demonstrated that the predictor constructs were related but sufficiently distinct to be included simultaneously in the structural model. Screening of the data also revealed no evidence of severe univariate or multivariate abnormalities that would compromise subsequent confirmatory factor analysis and structural equation modeling.

Table 2. Correlations Among Dual Continuity Leadership, Information Systems Continuity, Business Continuity, Organizational Innovation, and Organizational Resilience

Variable	1	2	3	4	5
1. Dual Continuity Leadership	1.00				
2. Information Systems Continuity	0.62**	1.00			
3. Business Continuity	0.59**	0.55**	1.00		
4. Organizational Innovation	0.51**	0.48**	0.44**	1.00	
5. Organizational Resilience	0.58**	0.54**	0.61**	0.52**	1.00

Table 2 shows that all correlations among the principal study variables were positive and statistically significant at the $p < .01$ level. Dual continuity leadership was strongly and positively associated with information systems continuity ($r = .62$, $p < .01$) and business continuity ($r = .59$, $p < .01$), indicating that stronger leadership commitment to the simultaneous preservation of digital infrastructure and critical business operations was associated with greater organizational capability to sustain or recover both technological and operational functions. Dual continuity leadership was also positively related to organizational innovation ($r = .51$, $p < .01$) and organizational resilience ($r = .58$, $p < .01$). These relationships suggest that continuity-oriented leadership is not restricted to defensive or recovery-related outcomes but is also associated with the organization's capacity to innovate and remain adaptive under conditions of disruption and uncertainty. Information systems continuity was positively correlated with organizational innovation ($r = .48$, $p < .01$) and organizational resilience ($r = .54$, $p < .01$), indicating that reliable, recoverable, and adaptive digital infrastructures may support both innovative activity and the ability to withstand and recover from disturbances. Business continuity was likewise positively related to organizational innovation ($r = .44$, $p < .01$), while its strongest bivariate association was observed with organizational resilience ($r = .61$, $p < .01$). The correlation between organizational innovation and organizational resilience was also statistically significant and positive ($r = .52$, $p < .01$), suggesting that organizations with stronger innovative capabilities also tended to demonstrate greater adaptive and recovery capacity. Importantly, none of the correlations approached values commonly associated with construct redundancy or severe multicollinearity, providing additional support for testing the proposed variables as theoretically related but empirically distinguishable constructs within the structural equation model.

Table 3. Measurement Model Reliability, Convergent Validity, and Discriminant Validity

Construct	Standardized Factor Loading Range	Cronbach's Alpha	Composite Reliability	AVE	√AVE
Dual Continuity Leadership	0.71–0.86	0.91	0.92	0.59	0.77
Information Systems Continuity	0.69–0.85	0.89	0.90	0.56	0.75
Business Continuity	0.70–0.84	0.90	0.91	0.57	0.75
Organizational Innovation	0.68–0.87	0.90	0.91	0.58	0.76
Organizational Resilience	0.72–0.88	0.92	0.93	0.62	0.79

The results of the confirmatory factor analysis and measurement-model evaluation are reported in Table 3. All observed indicators loaded satisfactorily on their intended latent constructs. Standardized factor loadings ranged from 0.71 to 0.86 for dual continuity leadership, 0.69 to 0.85 for information systems continuity, 0.70 to 0.84 for business continuity, 0.68 to 0.87 for organizational innovation, and 0.72 to 0.88 for organizational resilience. These factor loadings indicated that the observed questionnaire items adequately represented their respective theoretical dimensions. Internal consistency was also strong across all constructs. Cronbach's alpha coefficients ranged from 0.89 for information systems continuity to 0.92 for organizational resilience, exceeding the minimum criterion of 0.70 and demonstrating satisfactory reliability. Composite reliability values ranged from 0.90 to 0.93, further confirming consistency among the indicators of each latent variable. The average variance extracted values ranged from 0.56 to 0.62 and were therefore greater than the recommended value of 0.50 for all constructs, establishing acceptable convergent validity. In other words, each latent construct explained more than half of the variance in its observed indicators. The square root of the average variance extracted ranged from 0.75 to 0.79 and exceeded the corresponding interconstruct correlations, supporting discriminant validity and indicating that dual continuity leadership, information systems continuity, business continuity, organizational innovation, and organizational resilience represented conceptually and empirically distinct dimensions. The overall confirmatory factor analysis additionally demonstrated satisfactory model fit, $\chi^2/df = 2.24$, comparative fit index = 0.947, Tucker–Lewis index = 0.939, incremental fit index = 0.948, goodness-of-fit index = 0.918, and root mean square error of approximation = 0.057. Taken together, these results indicated that the measurement model possessed adequate reliability, convergent validity, discriminant validity, and overall factorial validity and was therefore suitable for subsequent structural equation modeling.

Table 4. Structural Model Path Coefficients and Hypothesis Testing

Structural Path	Standardized β	SE	Critical Ratio	p	Result
Dual Continuity Leadership → Information Systems Continuity	0.62	0.058	10.74	<.001	Supported
Dual Continuity Leadership → Business Continuity	0.59	0.061	9.67	<.001	Supported
Information Systems Continuity → Organizational Innovation	0.31	0.067	4.63	<.001	Supported
Business Continuity → Organizational Innovation	0.22	0.064	3.44	.001	Supported
Information Systems Continuity → Organizational Resilience	0.26	0.062	4.19	<.001	Supported
Business Continuity → Organizational Resilience	0.42	0.060	7.00	<.001	Supported
Dual Continuity Leadership → Organizational Innovation	0.21	0.065	3.23	.001	Supported
Dual Continuity Leadership → Organizational Resilience	0.19	0.061	3.11	.002	Supported

The structural equation modeling results presented in Table 4 confirmed all hypothesized direct relationships. Dual continuity leadership had a strong positive effect on information systems continuity ($\beta = 0.62$, SE = 0.058, CR = 10.74, $p < .001$), indicating that an increase in leadership practices emphasizing coordinated technological and business continuity was associated with a substantial increase in the organization's capability to maintain and recover critical information systems. Dual continuity leadership also exerted a significant positive effect on business continuity ($\beta = 0.59$, SE = 0.061, CR = 9.67, $p < .001$), demonstrating that leadership commitment to preparedness, coordinated response, continuity planning, and resource allocation strengthened the organization's capacity to sustain critical business processes during disruptive events. Information systems continuity positively predicted organizational innovation ($\beta = 0.31$, SE = 0.067, CR = 4.63, $p < .001$), while business continuity also contributed significantly to innovation ($\beta = 0.22$, SE = 0.064, CR = 3.44, $p = .001$). These results indicate that innovation in high-tech firms is facilitated not only by the availability and recoverability of technological systems but also by the continuity of essential organizational activities, because stable technological and operational infrastructures appear to create conditions in which experimentation, technological adoption, and new product or process development can be sustained despite uncertainty. Both continuity dimensions also significantly predicted organizational resilience. Information systems continuity had a positive effect on resilience ($\beta = 0.26$, SE = 0.062, CR = 4.19, $p < .001$), whereas business continuity demonstrated an even stronger positive effect ($\beta = 0.42$, SE = 0.060, CR = 7.00, $p < .001$). The stronger coefficient for business continuity suggests that preserving critical business functions, response coordination, and operational recovery capacity constitutes a particularly important foundation of organizational resilience. Dual continuity leadership further retained significant direct effects on organizational innovation (β = 0.21, p = .001) and organizational resilience (β = 0.19, p = .002) after the two continuity mechanisms were incorporated into the model. This pattern indicated that the influence of leadership was only partially transmitted through information systems continuity and business continuity and that dual continuity leadership also contributed independently to innovation and resilience through broader mechanisms such as strategic alignment, rapid decision-making, organizational learning, resource mobilization, and cross-functional coordination. The final structural model demonstrated satisfactory fit to the observed data, $\chi^2/df = 2.37$, CFI = 0.941, TLI = 0.934, IFI = 0.942, GFI = 0.912, and RMSEA = 0.060, confirming that the proposed structural relationships provided an acceptable representation of the empirical covariance structure.

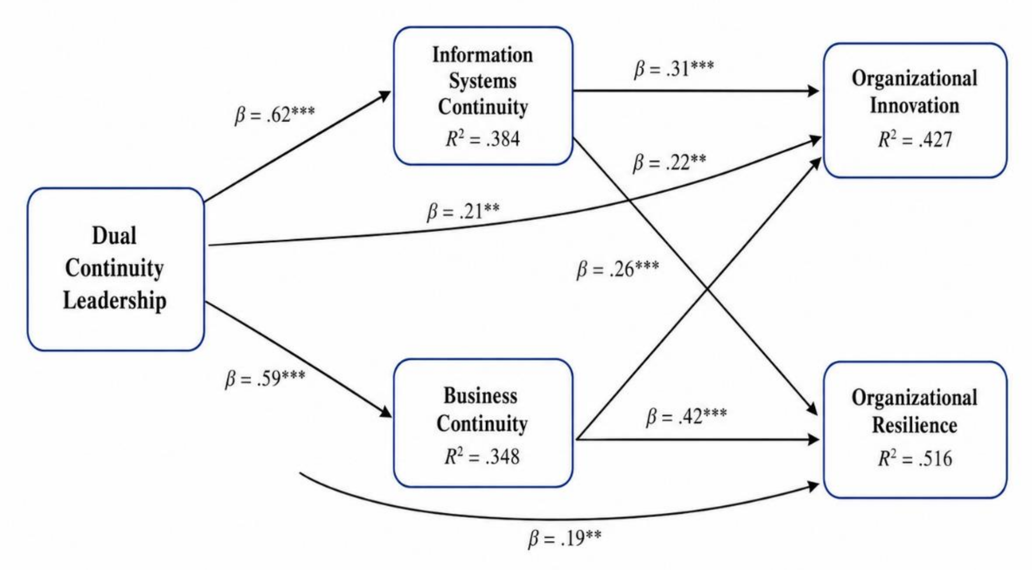


Figure 1. Structural Model of the Relationships Among Dual Continuity Leadership, Information Systems Continuity, Business Continuity, Organizational Innovation, and Organizational Resilience

Table 5. Direct, Indirect, and Total Effects of Dual Continuity Leadership on Organizational Innovation and Organizational Resilience

Outcome and Effect	Standardized Effect	Bootstrapped SE	95% Lower CI	95% Upper CI	p
Direct effect on Organizational Innovation	0.21	0.063	0.086	0.334	.001
Indirect effect through Information Systems Continuity	0.19	0.044	0.112	0.284	<.001
Indirect effect through Business Continuity	0.13	0.039	0.061	0.215	.001
Total indirect effect on Organizational Innovation	0.32	0.052	0.221	0.425	<.001
Total effect on Organizational Innovation	0.53	0.058	0.416	0.642	<.001
Direct effect on Organizational Resilience	0.19	0.059	0.075	0.306	.002
Indirect effect through Information Systems Continuity	0.16	0.041	0.087	0.248	<.001
Indirect effect through Business Continuity	0.25	0.048	0.164	0.351	<.001
Total indirect effect on Organizational Resilience	0.41	0.055	0.309	0.523	<.001
Total effect on Organizational Resilience	0.60	0.061	0.481	0.718	<.001

The mediation analysis reported in Table 5 provides further evidence for the central proposition of the study that dual continuity leadership influences innovation and resilience partly by strengthening information systems continuity and business continuity. The direct effect of dual continuity leadership on organizational innovation remained statistically significant after the mediators were included in the model ($\beta = 0.21$, $p = .001$). At the same time, the indirect effect through information systems continuity was significant ($\beta = 0.19$, bootstrapped 95% CI [0.112, 0.284], $p < .001$), as was the indirect effect through business continuity ($\beta = 0.13$, bootstrapped 95% CI [0.061, 0.215], $p = .001$). The combined indirect effect of dual continuity leadership on organizational innovation was therefore 0.32, and its confidence interval did not include zero. The total standardized effect on innovation reached 0.53 ($p < .001$), indicating a substantively meaningful overall association. Comparison of the two innovation-related indirect pathways indicated that information systems continuity constituted the stronger mediating mechanism for innovation. This finding is theoretically consistent with the technology-intensive context of the sampled firms, where stable access to digital infrastructures, information, data, platforms, and technological services may be especially important for maintaining experimentation, development work, knowledge sharing, and the implementation of new technological solutions.

A similar but even stronger mediation pattern emerged for organizational resilience. The direct effect of dual continuity leadership on resilience remained significant ($\beta = 0.19$, $p = .002$), while the indirect pathway through information systems continuity was statistically significant ($\beta = 0.16$, bootstrapped 95% CI [0.087, 0.248], $p < .001$). The indirect effect transmitted through business continuity was larger ($\beta = 0.25$, bootstrapped 95% CI [0.164, 0.351], $p < .001$), indicating that the organizational ability to preserve critical processes, coordinate responses, and restore operations served as the dominant continuity mechanism linking leadership to resilience. The total indirect effect on resilience was 0.41, and the total effect of dual continuity leadership on resilience reached 0.60 ($p < .001$), representing the strongest total relationship identified in the model. Because the direct paths from dual continuity leadership to both innovation and resilience remained statistically significant after inclusion of the mediators, the findings supported partial rather than complete mediation. Thus, the empirical results suggest that dual continuity leadership exerts its effects through two complementary mechanisms. One mechanism concerns the technological continuity of information systems, data, and digital services, whereas the second concerns the continuity of essential organizational and operational processes. At the same time, leadership retains an independent contribution to both outcomes, indicating that leadership practices themselves provide strategic, relational, and adaptive resources that cannot be reduced entirely to formal continuity capabilities.

The explanatory power of the structural model was also substantial. Dual continuity leadership explained 38.4% of the variance in information systems continuity and 34.8% of the variance in business continuity. When dual continuity leadership, information systems continuity, and business continuity were considered simultaneously, the model explained 42.7% of the variance in organizational innovation and 51.6% of the variance in organizational resilience. The higher proportion of explained variance for resilience demonstrates that the proposed dual continuity framework was particularly effective in accounting for differences in organizations' capacity to withstand, adapt to, and recover from disruptions. Nevertheless, the explained variance in organizational innovation was also meaningful, indicating that continuity capabilities are not merely protective capacities but may function as enabling conditions for innovative performance. Taken together, the direct, indirect, and total effects strongly supported the proposed theoretical model and demonstrated that dual continuity leadership is associated with high-tech firms' innovation and resilience both directly and through the simultaneous reinforcement of information systems continuity and business continuity.

4. Discussion and Conclusion

The present study examined the role of dual continuity leadership in strengthening information systems continuity and business continuity and, through these mechanisms, enhancing organizational innovation and organizational resilience in high-tech firms. The findings provided broad support for the proposed conceptual model. Dual continuity leadership had significant positive effects on both information systems continuity and business continuity, while both continuity capabilities significantly contributed to organizational innovation and resilience. In addition, dual continuity leadership retained significant direct effects on innovation and resilience after the mediating variables were incorporated into the model. The mediation analysis further showed that information systems continuity and business continuity partially transmitted the effects of dual continuity leadership to both outcomes. The total effect of dual continuity leadership was stronger for organizational resilience than for organizational innovation, and business continuity emerged as the stronger mediator in the relationship with resilience, whereas information systems continuity played a comparatively stronger mediating role in relation to innovation. Collectively, these results support the central proposition that leadership in high-tech firms can generate strategic value by simultaneously sustaining technological systems and critical business operations rather than treating these two continuity domains as isolated organizational concerns.

The first major finding was that dual continuity leadership significantly predicted information systems continuity, with a relatively strong standardized path coefficient. This result indicates that information systems continuity is not merely a function of technological infrastructure, backup systems, or disaster recovery tools, but is also shaped by leadership commitment, strategic prioritization, coordination, resource allocation, and preparedness. In high-tech firms, leaders determine the extent to which continuity concerns are integrated into technology strategy, whether sufficient investments are directed toward redundancy and recovery capacity, and whether technological and operational teams coordinate effectively during disruption. This finding is consistent with research emphasizing that information system sustainment depends on a combination of technical, managerial, and organizational factors rather than on technology alone [11]. It also aligns with broader information systems continuance research showing that sustained system use and effectiveness are influenced by contextual, organizational, and post-adoption conditions [6, 7]. Studies of continuance across cloud-based and digital systems similarly demonstrate that users' continued engagement with technology depends on perceived usefulness, satisfaction, system quality, and supportive organizational conditions [8-10, 22]. The present findings extend these perspectives from individual-level continuance toward organizational-level continuity by suggesting that leadership can create the managerial conditions required for critical information systems to remain reliable, recoverable, and strategically sustainable.

Dual continuity leadership also had a significant and substantial positive effect on business continuity. This result suggests that leaders who actively coordinate continuity priorities, define responsibilities, allocate resources, encourage scenario planning, and integrate continuity into routine strategic decision-making can improve an organization's ability to maintain or rapidly restore essential processes. This finding is compatible with contemporary business continuity frameworks that emphasize governance, strategic integration, business impact analysis, recovery planning, and cross-functional coordination as key elements of continuity capability [2, 4]. It is also consistent with the view that continuity management in digitally dependent organizations must move beyond isolated emergency procedures toward an integrated organizational system linking technology, operations, people, and external dependencies [3]. The strong leadership effect observed in this study further corresponds with research on leadership continuity and succession planning, which demonstrates that maintaining strategic direction, institutional knowledge, and leadership capacity is itself essential for organizational continuity [17-19]. From this perspective, leaders do not simply approve continuity plans; they shape the organizational architecture through which continuity becomes embedded in decision-making, communication, and resource deployment.

Another important finding was that information systems continuity significantly predicted organizational innovation. This relationship suggests that innovation in high-tech firms depends partly on stable and recoverable digital infrastructure. Innovation activities typically require continuous access to data, development environments, communication platforms, knowledge repositories, analytical systems, and collaborative technologies. When such systems are reliable and recoverable, employees and innovation teams can experiment with lower operational uncertainty and can preserve project momentum during disruptive events. This result is consistent with evidence showing that IT capabilities contribute to organizational adaptability and resilience by facilitating information access, communication, coordination, and resource integration [14]. Although earlier information systems continuance studies primarily focused on sustained use rather than innovation outcomes, they collectively demonstrate that system quality, contextual support, and continued technological engagement are critical for maintaining value creation from information systems [6, 8, 22]. The present study expands this line of reasoning by indicating that technological continuity may function as an enabling infrastructure for innovation, particularly in firms whose products, processes, and competitive capabilities depend heavily on digital systems.

Business continuity also had a significant positive effect on organizational innovation, although this effect was weaker than the effect of information systems continuity. This finding is theoretically meaningful because it shows that operational stability and innovation are not necessarily contradictory. While business continuity emphasizes maintaining essential functions, innovation requires experimentation and change; however, reliable operational foundations may provide the stability necessary for risk-taking and creative exploration. Firms that can preserve key processes during periods of disruption are less likely to divert all resources toward crisis management and may therefore retain greater capacity to pursue new products, services, and process improvements. The finding aligns with the broader concept of ambidextrous leadership, which proposes that innovation is strengthened when organizations balance exploratory and exploitative demands rather than privileging only flexibility or only control [20]. Dual continuity leadership can be interpreted as a continuity-oriented manifestation of this balancing capacity: leaders maintain operational reliability while preserving conditions for adaptation and experimentation. This result also corresponds with leadership research emphasizing that effective leadership can create supportive, relational, and developmental conditions that facilitate employee initiative and organizational effectiveness [21].

The results further showed that information systems continuity significantly enhanced organizational resilience. This finding supports the argument that reliable and adaptable digital systems constitute an important foundation for resilience in contemporary high-tech organizations. During disruption, access to timely information, communication technologies, critical databases, and decision-support systems becomes especially important because organizations must detect changes, coordinate responses, allocate resources, and modify operations rapidly. The finding is closely aligned with research showing that IT capabilities strengthen organizational resilience in digital enterprises by supporting information processing, social capital, and adaptive coordination [14]. It is also consistent with capability-based conceptualizations of resilience that emphasize anticipation, coping, and adaptation as interconnected organizational processes [12]. Information systems continuity can contribute to each of these stages by enabling risk monitoring before disruption, maintaining communication and information availability during a crisis, and supporting learning and reconfiguration afterward. Thus, the present result suggests that continuity of digital systems should be regarded as part of organizational resilience capability rather than merely as a technical recovery function.

Business continuity showed an even stronger positive effect on organizational resilience, representing one of the strongest structural paths in the model. This result is consistent with the conceptual proximity between business continuity and resilience, while also confirming that they remain distinct constructs. Business continuity provides the operational mechanisms through which critical activities can be preserved or rapidly restored, whereas resilience involves a broader capacity to anticipate threats, absorb shocks, adapt, and learn. Herbane emphasized the need to reconsider business continuity within the broader field of organizational resilience, arguing that continuity practices can contribute to adaptive capacity when they are integrated strategically [15]. Similarly, contemporary discussions distinguish business continuity from business resilience but recognize that the former provides an important foundation for the latter [16]. The present findings empirically reinforce this distinction. Business continuity was strongly associated with resilience, yet the two constructs were not redundant, suggesting that continuity mechanisms support resilience without fully defining it. The result also aligns with the argument that organizations develop resilience through strategic resources, human capabilities, preparedness, flexibility, and coordinated responses to adversity [12, 13].

The direct effects of dual continuity leadership on both innovation and resilience remained statistically significant after information systems continuity and business continuity were introduced as mediators. This partial mediation pattern suggests that dual continuity leadership contributes to these outcomes through additional mechanisms beyond formal continuity capabilities. Leaders may directly influence innovation through strategic vision, encouragement of experimentation, rapid decision-making, and cross-functional collaboration, while contributing to resilience through trust, communication, sensemaking, resource mobilization, and organizational learning. This interpretation is compatible with ambidextrous leadership theory, according to which leaders facilitate innovation by flexibly combining behaviors that encourage exploration with behaviors that support implementation and control [20]. It also corresponds with servant leadership research emphasizing the role of supportive and relational leadership in fostering organizational functioning and employee development [21]. In the context of continuity, these leadership behaviors may help employees respond to disruption with greater confidence, flexibility, and coordination even when formal continuity plans alone are insufficient.

The mediation findings provide further insight into how dual continuity leadership translates into strategic organizational outcomes. Information systems continuity was the stronger mediator in the relationship between dual continuity leadership and innovation, whereas business continuity was the stronger mediator in the relationship between leadership and resilience. This distinction is consistent with the characteristics of high-tech firms. Innovation in these organizations is heavily dependent on reliable technological infrastructure, digital collaboration, data availability, and continuous access to information systems. Consequently, leadership may stimulate innovation particularly effectively by ensuring the continuity of these technological resources. By contrast, resilience depends more broadly on the ability to preserve critical functions, coordinate responses, maintain stakeholder services, and restore operations under adverse conditions, making business continuity a more direct mechanism for resilience. This interpretation is consistent with digital ecosystem approaches to continuity management that emphasize the need to integrate technological and operational dimensions while recognizing that they make different contributions to organizational outcomes [3, 5].

The findings also contribute to the understanding of business continuity as a forward-looking strategic capability rather than a narrowly reactive function. Emerging continuity research emphasizes horizon scanning, anticipation of new risks, and preparation for evolving technological and organizational threats [1]. High-tech firms confront risks that are difficult to predict because technological change can alter both the nature and speed of disruptions. Under such conditions, continuity must be continuously updated rather than treated as a static emergency document. The significant relationships observed between dual continuity leadership, continuity capabilities, innovation, and resilience support the argument that continuity management should be integrated into strategic leadership and organizational adaptation. A leadership approach that simultaneously protects critical systems and operations may improve not only recovery capacity but also the firm's ability to innovate under uncertainty. In this respect, dual continuity leadership provides a potentially useful bridge between continuity management, information systems sustainment, innovation leadership, and resilience research.

Overall, the findings support the proposed conceptualization of dual continuity leadership as an integrative leadership capability with both protective and developmental functions. Its protective function is reflected in stronger information systems continuity and business continuity, while its developmental function is reflected in higher innovation and resilience. The results therefore challenge an overly narrow view in which continuity is associated only with risk avoidance and operational conservatism. Instead, continuity can provide the infrastructure and organizational confidence required for adaptive action. This conclusion is consistent with research emphasizing that resilience emerges from the capacity to anticipate, respond, and adapt rather than merely survive disruption [12]. It also extends current continuity frameworks by showing that the simultaneous leadership of digital and business continuity may be particularly consequential in technology-intensive organizational settings. In this sense, dual continuity leadership can be considered a strategic capability that enables firms to remain operationally dependable while retaining the flexibility necessary for innovation and long-term adaptation.

One limitation of this study concerns its cross-sectional research design, which restricts the extent to which causal relationships can be inferred from the observed associations. Although structural equation modeling allowed simultaneous examination of direct and indirect relationships, the data were collected at a single point in time and therefore cannot establish the temporal sequence through which leadership practices develop continuity capabilities and subsequently influence innovation and resilience. A second limitation is the reliance on self-report questionnaires, which may increase the risk of common method variance, socially desirable responding, and perceptual bias. In addition, the study was conducted among high-tech firms in Tehran, and the characteristics of the local institutional, economic, technological, and regulatory environment may limit the generalizability of the findings to firms operating in other geographical contexts. The use of individual perceptions to assess organization-level constructs also represents a limitation because employees may differ in their awareness of continuity procedures, technological recovery capabilities, and strategic leadership practices. Finally, although the proposed model explained a meaningful proportion of variance in innovation and resilience, other variables such as organizational culture, environmental turbulence, cybersecurity maturity, strategic flexibility, organizational learning, and resource availability were not included in the model.

Future research should examine the proposed model through longitudinal and multiwave designs in order to establish more clearly how dual continuity leadership develops over time and whether changes in leadership practices precede improvements in information systems continuity, business continuity, innovation, and resilience. Future studies could also compare high-tech firms across cities, countries, industries, and organizational sizes to determine whether the strength of the proposed relationships varies according to technological intensity, environmental uncertainty, or institutional context. Multilevel research would be particularly valuable because dual continuity leadership may operate simultaneously at executive, departmental, team, and individual levels.

Researchers could also incorporate objective indicators such as system downtime, recovery time, continuity test results, innovation outputs, patent activity, product launches, or post-disruption performance alongside perceptual measures. Additional studies may examine moderators such as environmental turbulence, digital maturity, cybersecurity preparedness, organizational learning, or innovation climate, as well as alternative mediators such as strategic agility, knowledge sharing, psychological safety, or resource reconfiguration. Qualitative and mixed-method studies could further clarify the specific behaviors through which leaders coordinate technological and business continuity during real disruptions.

From a practical perspective, high-tech firms should treat dual continuity leadership as an integrated managerial responsibility rather than assigning information systems continuity and business continuity to isolated technical or administrative units. Senior leaders should ensure that continuity priorities are incorporated into strategic planning, technology investment, innovation management, and leadership development. Organizations can strengthen this capability by establishing cross-functional continuity teams that include information technology, operations, risk management, human resources, research and development, and senior management. Continuity plans should be tested regularly through realistic scenarios, and lessons from exercises or actual disruptions should be translated into revisions of systems, processes, and responsibilities. Firms should also develop technological redundancy, reliable backup and recovery mechanisms, alternative operational arrangements, succession mechanisms for critical leadership roles, and clear decision protocols for crises. At the same time, continuity measures should be designed in ways that preserve experimentation and innovation rather than creating excessive rigidity. Managers should therefore balance control with flexibility, protect essential functions while allowing adaptive responses, and ensure that employees have access to the information, resources, and authority needed to respond effectively when disruptions occur.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all participants who participate in this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

References

[1] O. B. Amara, "Ontological Framework for Horizon Scanning of Business Continuity Research," ed, 2025.
[2] N. Russo, "Towards a Comprehensive Framework for Business Continuity Management: Strategic Guidelines for BCM Programs," *International Journal of Business Continuity and Risk Management*, 2024.

[3] J. De Matteis, "Business Continuity Management: Strategies for Resilience in Digital Ecosystems," *Journal of Business Continuity & Emergency Planning,* vol. 16, no. 3, pp. 210-223, 2023.
[4] S. A. Torabi, M. Rezaei, and N. Sahebjamnia, "A New Framework for Business Impact Analysis in Business Continuity Management (with a Case Study)," *Safety Science,* vol. 89, pp. 201-218, 2016, doi: 10.1016/j.ssci.2016.06.015.
[5] D. M. Kesa, "Ensuring Resilience: Integrating IT Disaster Recovery and Business Continuity," in *WJARR*, ed, 2023, p. 1166.
[6] V. Venkatesh, J. Y. Thong, F. K. Chan, P. J. H. Hu, and S. A. Brown, "Extending the Two-Stage Information Systems Continuance Model: Incorporating UTAUT Predictors and the Role of Context," *Information Systems Journal,* vol. 21, no. 6, pp. 527-555, 2011, doi: 10.1111/j.1365-2575.2011.00373.x.
[7] A. Tarhini, N. A. G. Arachchilage, and M. S. Abbasi, "A Critical Review of Theories and Models of Technology Adoption and Acceptance in Information System Research," *International Journal of Technology Diffusion,* vol. 6, no. 4, pp. 58-77, 2015, doi: 10.4018/IJTD.2015100104.
[8] T. Zhou, "Understanding Location-Based Services Continuance: An IS Success Model Perspective," *International Journal of Mobile Communications,* vol. 14, no. 6, pp. 553-567, 2016, doi: 10.1504/IJMC.2016.078116.
[9] Q. Liu, F. Zhang, M. Mao, B. Xue, and Z. Lin, "An Empirical Study on Factors Affecting Continuance Intention of Using Yu'e Bao," *Tehnički Vjesnik,* vol. 25, no. 5, pp. 1414-1420, 2018, doi: 10.17559/TV-20170622120150.
[10] H. Al-Samarraie, B. K. Teng, A. I. Alzahrani, and N. Alalwan, "E-Learning Continuance Satisfaction in Higher Education: A Unified Perspective from Instructors and Students," *Studies in Higher Education,* vol. 43, no. 11, pp. 2003-2019, 2018, doi: 10.1080/03075079.2017.1298088.
[11] A. Moslemi, "Modelling the Effect of Information System Sustainment Factors," *Journal of Industrial Engineering and Management Studies,* vol. 11, no. 2, pp. 14-26, 2024.
[12] S. Duchek, "Organizational Resilience: A Capability-Based Conceptualization," *Business Research,* vol. 13, no. 1, pp. 215-246, 2020, doi: 10.1007/s40685-019-0085-7.
[13] C. A. Lengnick-Hall, T. E. Beck, and M. L. Lengnick-Hall, "Developing a Capacity for Organizational Resilience through Strategic Human Resource Management," *Human Resource Management Review,* vol. 21, no. 3, pp. 243-255, 2011, doi: 10.1016/j.hrmr.2010.07.002.
[14] M. Li, W. Zhang, and Y. Wang, "IT Capabilities, Social Capital, and Organizational Resilience: Evidence from Digital Enterprises," *Nature Communications,* vol. 15, no. 1, p. 1234, 2024, doi: 10.1038/s41599-024-03951-0.
[15] B. Herbane, "Rethinking Organizational Resilience and Business Continuity," *Journal of Contingencies and Crisis Management,* vol. 27, no. 3, pp. 183-192, 2019, doi: 10.1111/1468-5973.12260.
[16] I. Splunk, "Business Continuity vs. Business Resilience: A Strategic Perspective," Splunk, 2024.
[17] I. Agba, "Strategic Succession Planning: Ensuring Leadership Continuity and Organizational Success," *Journal of Organizational Culture, Communications and Conflict,* vol. 28, no. 2, 2024.
[18] C. Anos, "Ensuring Leadership Continuity: An Integrative Review of Succession Planning, Leadership Development and Organisational Memory," *Edelweiss Applied Science and Technology,* vol. 9, no. 5, pp. 2869-2877, 2025, doi: 10.55214/25768484.v9i5.7607.
[19] N. Nurinaya and S. Marhumi, "Leadership Strategy Evaluation and Succession Planning in Preparing the Company's Future Leaders," *Advances in Human Resource Management Research,* vol. 3, no. 1, pp. 1-14, 2025, doi: 10.60079/ahrmr.v3i1.405.
[20] K. Rosing, M. Frese, and A. Bausch, "Explaining the Heterogeneity of the Leadership–Innovation Relationship: Ambidextrous Leadership," *Leadership Quarterly,* vol. 22, no. 5, pp. 956-974, 2011, doi: 10.1016/j.leaqua.2011.07.014.
[21] N. Eva, M. Robin, S. Sendjaya, D. van Dierendonck, and R. C. Liden, "Servant Leadership: A Systematic Review and Call for Future Research," *Leadership Quarterly,* vol. 30, no. 1, pp. 111-132, 2019, doi: 10.1016/j.leaqua.2018.07.004.
[22] Y. M. Cheng, "Drivers of Physicians' Satisfaction and Continuance Intention toward the Cloud-Based Hospital Information System," *Kybernetes,* vol. 50, no. 2, pp. 413-442, 2020, doi: 10.1108/K-07-2019-0484.