

The impact of digital transformation on organizational performance with the mediating role of strategic agility in Iranian manufacturing industries (Method: Structural Equation Modeling)

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Abstract

The purpose of this study is to examine the impact of digital transformation on organizational performance with the mediating role of strategic agility in Iran's manufacturing industries. Considering technological challenges, resource constraints, and competitive pressures, the research develops an integrated model based on the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and Technology–Organization–Environment (TOE) framework to clarify the mechanisms linking digital initiatives to performance outcomes. The research employed a quantitative approach using Structural Equation Modeling (SEM). Data were collected through a standardized questionnaire distributed among 400 managers and experts in Iranian manufacturing firms. Reliability and validity of the measurement instruments were tested using Cronbach's alpha, KMO, and Bartlett's test in SPSS, and the conceptual model was estimated using AMOS to assess the structural relationships among variables. The findings revealed that digital orientation and digital capacity positively influence digital transformation; digital transformation enhances organizational agility; and strategic agility significantly improves both financial and non-financial performance. The model demonstrated good fit indices and confirmed the proposed hypotheses. Based on the results, it is recommended that managers in Iranian manufacturing industries invest strategically in digital infrastructure, develop human digital skills, and foster a culture of innovation to facilitate digital transformation. Moreover, strategic agility should be institutionalized as a core organizational capability to enable firms to thrive in turbulent and highly competitive environments, thereby improving both financial and non-financial outcomes.

Keywords: Digital Transformation, Organizational Performance, Strategic Agility
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1 Introduction

In the rapidly digitalizing global economic landscape, the competitive dynamics of international markets have undergone profound transformations, compelling firms to adopt more agile, technology-driven strategies to maintain

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adaptability and ensure survival. This phenomenon is particularly pronounced in emerging markets, where digital transformation is inevitable due to underdeveloped institutional infrastructures, limited innovation capacity, and increasing global pressures. Despite remarkable economic growth, these countries simultaneously face digital divides, technological inequalities, and fragmented policy environments—factors that render the outcomes of digital transformation highly uneven and unpredictable [23].

Within the context of today's transitional and competitive economy, Iran's manufacturing industries, like many sectors in developing countries, are confronted with an increasing imperative for digital transformation. Among these, various manufacturing sectors—including machinery and equipment industries—are recognized as foundational pillars of the country's industrialization and modernization efforts. However, these industries face serious challenges such as reliance on legacy technologies, shortages of digitally skilled human resources, weaknesses in organizational capabilities, and intensified competition from firms with higher digital maturity. Although the importance of digital transformation in enhancing competitiveness and organizational performance is well acknowledged, many manufacturing firms still struggle with formulating coherent digital strategies, effectively allocating technological resources, and managing internal resistance to change and innovation.

This situation creates a dual challenge: on one hand, the need to invest in technology amid resource constraints, and on the other, the necessity to empower and align organizational capabilities with an unstable institutional and economic environment. In this context, examining the impact of digital transformation on organizational performance, and the mediating role of strategic agility in Iran's manufacturing industries, becomes particularly significant, as understanding these relationships can facilitate improvements in organizational competitiveness and efficiency [25, 41].

Previous research—primarily conducted in advanced economies [9, 44, 6]—has demonstrated that digital transformation can positively influence organizational performance. However, many studies also report that over 70% of digital transformation initiatives fail to achieve strategic outcomes, mainly due to the absence of requisite organizational capabilities to effectively leverage digital investments [28]. Other critical failure factors include the lack of comprehensive digital strategies, employee resistance, misalignment of organizational cultures [7], shortages of digital skills and capacity [48], and limitations in digital orientation and adaptability [3, 29].

In this regard, a growing body of research emphasizes the role of organizational agility as a mediator or moderator in the relationship between digital transformation and performance [3], between digital leadership and digital transformation success [2], or even as a capability that is itself enhanced through digital transformation [21]. Generally, agility refers to an organization's ability to sense, respond rapidly, and adapt effectively to changes in technological and business environments. Nonetheless, the mechanisms through which digital transformation enhances agility, and how this agility subsequently translates into financial or non-financial performance, remain underexplored.

Currently, there exists a significant gap in both domestic and international literature regarding the elucidation of the relationships among digital transformation, strategic agility, and organizational performance. Although existing research has shown that digital transformation can yield positive outcomes for organizations, a deep and systematic understanding of the mechanisms through which digital transformation leads to improvements in financial and non-financial performance remains limited. One of the most critical shortcomings is the insufficient attention to the role of strategic agility as a key capability in this process—a capability that enables organizations to sense environmental changes, respond rapidly, and realign resources according to new conditions.

Despite the importance of this issue, no quantitative study in Iran has empirically examined the structural relationships among digital transformation, strategic agility, and organizational performance. Existing studies have predominantly focused on the direct effects of digital transformation on performance, neglecting the crucial mediating role of strategic agility.

Specifically, the literature highlights three major gaps:

1. A lack of understanding of how digital transformation, and through which mechanisms, can enhance strategic agility in manufacturing organizations;
2. An absence of empirical evidence regarding the mediating role of strategic agility in transmitting the effects of digital transformation to organizational performance (both financial and non-financial);
3. The lack of a comprehensive and localized model capable of integrating and analyzing these relationships within the context of Iran's manufacturing industries—characterized by resource constraints, technological challenges, and an unstable institutional environment.

To address these gaps, the present study aims to develop and empirically test a model that investigates the relationships among digital orientation, digital capability, digital transformation, organizational agility, and organizational

performance (both financial and non-financial) within Iran's manufacturing sector.

2 Literature Review

Understanding how organizations respond to digital disruptions and achieve superior performance requires a robust theoretical foundation. To examine the relationship among digital transformation, organizational agility, and performance, this study relies on three key theoretical perspectives: the Resource-Based View (RBV), the Dynamic Capabilities Theory (DCT), and the Technology–Organization–Environment (TOE) framework. Integrating these perspectives provides a comprehensive and multidimensional understanding of how internal resources, adaptable capabilities, and external contextual factors collectively influence firms' operational effectiveness [38, 4, 37].

The Resource-Based View (RBV) posits that firms can achieve sustainable competitive advantage by identifying, developing, and deploying resources that are valuable, rare, inimitable, and non-substitutable (VRIN) [4]. These resources may include tangible assets such as information technology infrastructures, equipment, and production facilities, or intangible assets such as digital skills, organizational knowledge, and an innovation-oriented culture [8]. RBV helps explain performance differences among firms [20]. However, its static and inward-looking nature—which focuses primarily on internal capabilities—limits its explanatory power in turbulent environments, particularly when facing digital disruption.

To address these limitations, the Dynamic Capabilities Theory (DCT) extends the RBV by emphasizing a firm's ability to integrate, build, and reconfigure internal and external capabilities in response to rapidly changing environments [37, 13]. This theory identifies three core capabilities: sensing opportunities and threats, seizing opportunities through strategic investments, and transforming organizational structures and assets [20, 21]. This framework aids in understanding how firms reconfigure digital resources and adapt strategies to enhance organizational agility.

Despite the foundational role of RBV and DCT in explaining the utilization and reconfiguration of internal resources, both approaches encounter limitations when applied to the context of digital transformation—a phenomenon heavily influenced by external forces. RBV emphasizes the accumulation and exploitation of organizational resources, such as digital infrastructure, organizational knowledge, and innovation culture [47, 4, 16]. In contrast, DCT focuses on more dynamic aspects, such as the organization's ability to sense opportunities and threats, acquire new resources, and transform existing capabilities [37, 13, 15]. Nevertheless, both theories are inherently inward-looking and provide limited insight into how environmental factors—including competitive intensity, shifting customer expectations, and the pace of technological change—shape the digital transformation process [1, 43, 33].

To address this theoretical gap, the Technology–Organization–Environment (TOE) framework, first introduced by Tornatzky et al. [38], has been widely recognized as a comprehensive framework for analyzing contextual factors affecting technology adoption and digital innovation. The TOE framework identifies three contextual dimensions:

- **Technological dimension** (technology readiness, compatibility, and maturity)
- **Organizational dimension** (firm size, structure, culture, and readiness for transformation)
- **Environmental dimension** (market competition, changing customer behaviors, and institutional regulations) [38, 27].

The TOE framework, by simultaneously encompassing internal and external factors, complements RBV and DCT, providing a more comprehensive understanding of organizational behavior in the course of digital transformation. This approach is particularly relevant in emerging markets, where institutional gaps, weak technological infrastructures, and shortages of digital skills pose significant challenges to the transformation process [34]. Recent research emphasizes that environmental factors—especially global competitive pressure, shifts in consumer behavior, and institutional reforms—often act as primary drivers of digital initiatives and business model reconfiguration.

For instance, Tuyen et al. [40] demonstrate that stringent regulatory pressures and institutional constraints significantly influence top management decisions to adopt digital transformation initiatives, particularly within turbulent business ecosystems. Similarly, studies on digital platforms in developing economies indicate that regulatory interventions—particularly those focused on managing competition-related risks—play a critical role in shaping the pace and direction of digital innovation and the redesign of business models.

Accordingly, integrating the TOE framework with RBV and DCT provides a multidimensional theoretical lens that transcends purely resource-based explanations, incorporating the environmental conditions and external contingencies that shape the digital transformation trajectory. This approach not only enhances the understanding of the dynamics of

digital transformation but also explains how firms reconfigure their capabilities in response to institutional, competitive, and technological pressures, thereby achieving strategic agility and superior performance.

This integrated perspective enables the current study to investigate how digital orientation and digital capability—as strategic resources within the RBV framework—are reconfigured through dynamic capabilities (DCT) and influenced by external technological and institutional contexts under the TOE model. Consequently, the proposed model offers a more comprehensive explanation of how firms initiate and implement digital transformation processes, develop digital agility, and ultimately enhance their financial and non-financial performance—particularly in Iran’s manufacturing industries, which face technological and institutional constraints.

In the era of accelerated digital transformation, organizational performance has long been recognized as a central topic in management research, reflecting the extent to which strategic objectives are achieved. However, in a period marked by unprecedented digital disruption and technological upheaval, performance measurement must extend beyond traditional financial indicators to include non-financial dimensions such as innovation capability, customer satisfaction, employee engagement, and sustainable development.

Recent studies have reinforced the view that performance is a multidimensional construct, influenced not only by internal organizational operations but also by the organization’s ability to adapt to external environmental changes [11, 24, 31]. Within this framework, organizational agility has emerged as a fundamental strategic capability, enabling firms to reallocate resources, reconfigure operational patterns, and leverage technological opportunities to enhance overall performance [46, 32].

Agility is not only an outcome of digital transformation but also serves as a key mediator linking internal capabilities to performance outcomes—particularly in environments characterized by high uncertainty and digital dynamism. Nevertheless, prior empirical research has often examined these relationships separately, lacking a comprehensive conceptual framework capable of explaining the complex interdependencies among these constructs.

One of the most fundamental prerequisites for organizational performance is the level of digital transformation achieved within the firm. Research indicates that successful digital transformation depends on a clear strategic orientation toward digitalization, as well as strong internal capabilities such as technological infrastructure, data analytics, and digital skills [19, 18]. However, most studies have examined these elements individually, without integrating them into a unified theoretical model based on complementary perspectives. This represents a critical gap in understanding the combined impact of digital orientation and digital capability on performance through organizational agility.

This gap is particularly pronounced in emerging markets, where organizations face challenges such as “shortages of digital talent,” “weak technological infrastructure,” and “institutional instability” [39]. In the machinery and manufacturing sectors—which are considered strategic pillars of industrial development—domestic firms are under increasing pressure from multinational corporations that possess stronger resources, more advanced technologies, and more integrated management systems. In such a context, understanding how digital transformation influences performance through organizational agility, and how contextual factors constrain this pathway, is both theoretically and practically essential.

Despite the significance of the topic, several research gaps remain:

1. Very few studies have simultaneously examined digital orientation and digital capability within an integrated theoretical framework. Although both factors are recognized as essential for digital transformation, the absence of a unified model has led to fragmented and superficial interpretations.
2. Empirical research on digital transformation in the manufacturing sector in emerging markets remains limited—particularly studies that account for “institutional voids,” “technological backwardness,” and “human resource constraints.”
3. Despite the growing attention to organizational agility in the digital transformation literature, few studies have empirically investigated the role of agility in enhancing organizational performance in environments characterized by “resource constraints” and “institutional weaknesses.”
4. Many prior studies have relied on only one or two theoretical frameworks and have failed to integrate the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and Technology–Organization–Environment (TOE) framework. Combining these three perspectives provides a comprehensive understanding of internal resources, strategic adaptations, and contextual limitations.

To address these gaps, the present study develops and empirically tests an integrated model based on the combined

explanatory power of RBV, DCT, and TOE. In this model, digital orientation and digital capability determine the degree of digital transformation; digital transformation enhances organizational agility; and agility, in turn, leads to improvements in both financial and non-financial performance. This multi-theoretical and context-driven model formulates a set of testable hypotheses to clarify the mechanisms linking “digital initiatives” to “performance outcomes” under conditions of resource constraints and institutional weakness.

Specifically, the research hypotheses are formulated as follows:

- **Hypothesis 1:** Digital orientation has a positive effect on the extent of digital transformation.
- **Hypothesis 2:** Digital capability has a positive effect on the extent of digital transformation.
- **Hypothesis 3:** Digital transformation has a positive effect on organizational agility.
- **Hypothesis 4:** Strategic agility has a positive effect on financial performance.
- **Hypothesis 5:** Strategic agility has a positive effect on non-financial performance.

Collectively, these hypotheses form the basis of the proposed conceptual model—a model reflecting the dynamic interaction among strategic intent and orientation, digital capabilities, organizational adaptive mechanisms, and multiple dimensions of performance. The model demonstrates how firms operating in emerging markets undergoing digital transformation can enhance their financial and non-financial performance through the alignment of resources, capabilities, and organizational agility. Based on these research hypotheses, the conceptual model is presented below:

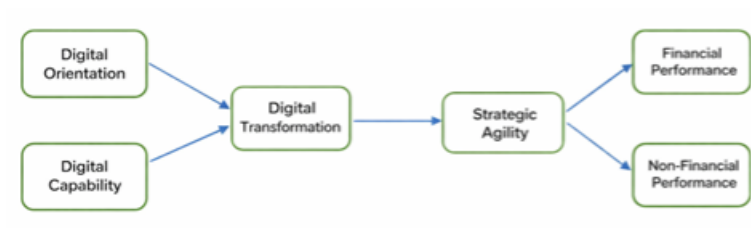


Figure 1: Conceptual model of Nguyen et al.'s research [26]

3 Research Methodology

In this study, a quantitative approach based on Structural Equation Modeling (SEM) was employed to empirically examine the relationships among digital transformation, strategic agility, and organizational performance in Iran's manufacturing industries. The primary data collection instrument was a standardized questionnaire developed based on theoretical foundations and previous studies. The questionnaire included a set of items to measure the main research variables—digital orientation, digital capability, digital transformation, organizational agility, and financial and non-financial performance. After conducting preliminary validity and reliability tests, the questionnaire was distributed among the target population. The sample size was determined to be 400 valid responses, considering the requirements of SEM and statistical adequacy, and the collected data served as the basis for analysis.

For data analysis, preliminary descriptive and diagnostic tests were first conducted, including reliability assessment using Cronbach's alpha and sampling adequacy evaluation using the KMO index and Bartlett's test, to ensure the questionnaire's reliability and validity. Subsequently, the data were entered into SPSS to perform initial statistical analyses, including the calculation of means, standard deviations, and correlations. This step helped identify preliminary patterns and examine data distribution, providing a foundation for more advanced analyses.

In the final step, AMOS software was employed to test the hypotheses and assess the structural relationships among variables. AMOS enables the estimation of structural equation models and allows researchers to examine both direct and indirect effects of variables within a comprehensive model. The conceptual model of the study, developed based on RBV, DCT, and TOE theories, was fitted using AMOS, and model fit indices such as CFI, RMSEA, and ξ^2/df were calculated. The results indicated that the proposed model demonstrated an adequate fit and that the research hypotheses were supported in the context of Iran's manufacturing industries. This quantitative and structural approach provided robust empirical evidence regarding the mediating role of strategic agility in transmitting the effects of digital transformation to organizational performance.

4 Research Findings

In this section, the data collected from the sample are analyzed using descriptive and inferential statistical methods, and the results are presented in tables along with relevant interpretations. The primary aim of this section is to address the research hypotheses and examine the relationships among the study variables. Initially, the validity and reliability of the measurement instruments are assessed using tests such as Cronbach's alpha and the KMO test. Subsequently, the statistical indices of the main research variables are presented. Finally, the hypotheses are tested using appropriate statistical methods.

Table 1: KMO and Bartlett's Test for Research Variables

Variable	KMO	Bartlett's χ^2	df	Explained Variance (%)	Significance Level
Digital Orientation	0.870	849.832	10	64.683	0.000
Digital Capability	0.884	1014.984	10	68.770	0.000
Digital Transformation	0.871	797.979	10	63.327	0.000
Strategic Agility	0.917	1353.330	15	67.579	0.000
Financial Performance	0.886	1107.663	10	71.676	0.000
Non-Financial Performance	0.880	1001.243	10	46.368	0.000

The KMO index for all variables exceeds 0.80, indicating very good sampling adequacy and suitability of the data for exploratory factor analysis (EFA). The significance level of Bartlett's test is 0.000 (< 0.05), suggesting that the correlation matrix is appropriate for factor analysis. The explained variance for each construct exceeds 60%, confirming the appropriateness of factor extraction. The use of Direct Oblimin rotation allows the preservation of correlations among factors and provides a more accurate analysis of the conceptual structure and interrelationships among variables. Therefore, the research data meet the necessary conditions for proceeding with confirmatory factor analysis (CFA) and structural equation modeling (SEM).

Table 2: Shapiro–Wilk Test Results for Assessing Normality of Variable Distributions

Variable	df	Shapiro–Wilk Statistic	Significance (Sig)
Digital Orientation	400	0.960	$P < 0.001$
Digital Capability	400	0.956	$P < 0.001$
Digital Transformation	400	0.962	$P < 0.001$
Strategic Agility	400	0.959	$P < 0.001$
Financial Performance	400	0.955	$P < 0.001$
Non-Financial Performance	400	0.957	$P < 0.001$

To examine the normality of the distributions of the main research variables, the Shapiro–Wilk test was employed. As shown in Table 2, the significance level for all variables is less than 0.05. Therefore, the null hypothesis of normal distribution is rejected at the 0.05 significance level. Consequently, the data for digital orientation, digital capability, digital transformation, strategic agility, financial performance, and non-financial performance are not normally distributed, and non-parametric tests should be used in subsequent analyses.

Table 3: Reliability Assessment of the Questionnaire Using Cronbach's Alpha

Variable	Number of Items	Cronbach's Alpha
Digital Orientation	5	0.863
Digital Capability	5	0.886
Digital Transformation	5	0.857
Strategic Agility	6	0.905
Financial Performance	5	0.896
Non-Financial Performance	5	0.885

One of the key indicators for evaluating the quality of measurement instruments is their reliability, which reflects the consistency of the instrument in producing similar results under the same conditions. In this study, Cronbach's alpha coefficient was used to assess the reliability of the questionnaires. Cronbach's alpha measures the internal consistency of the items related to each construct and ranges from 0 to 1. The closer the alpha value is to 1, the greater the coherence among the items of a construct, indicating higher reliability of the measurement tool. According to common guidelines, an alpha value above 0.7 indicates acceptable reliability, values above 0.8 indicate good reliability, and values above 0.9 indicate excellent reliability. Based on Nanelli and Bernstein (1994), a Cronbach's alpha greater

than 0.7 reflects acceptable instrument reliability. As observed, all variables—digital orientation, digital capability, digital transformation, strategic agility, financial performance, and non-financial performance—have alpha coefficients above 0.8, indicating very good reliability.

Table 4: Descriptive Statistics of the Main Research Variables

Variable	No. of Items	Max/Min Ratio	Variance	Kurtosis	Skewness	Range	Max	Min	Mean
Digital Orientation	5	4.00	0.337	1.987	-0.852	3	4	1	2.24
Digital Capability	5	4.00	0.291	1.015	-0.733	3	4	1	2.12
Digital Transformation	5	5.00	0.450	-0.281	-0.630	4	5	1	1.87
Strategic Agility	6	4.00	0.394	1.324	-0.835	3	4	1	2.15
Financial Performance	5	4.00	0.386	0.731	-0.801	3	4	1	2.00
Non-Financial Performance	5	5.00	0.387	0.625	-0.731	4	5	1	2.08

The table above presents the descriptive statistics for the research variables. For instance, the mean values for the variables are as follows: digital orientation 2.24, digital capability 2.12, digital transformation 1.87, strategic agility 2.15, financial performance 2.00, and non-financial performance 2.08. These results suggest that the organizations under study face structural and operational challenges in digital and performance domains.

The minimum and maximum values indicate the lowest and highest responses across the manufacturing sector in Iran. Skewness measures the asymmetry of the distribution. A perfectly symmetric distribution has a skewness of zero; a negative skew indicates a longer tail toward lower values, and a positive skew indicates a longer tail toward higher values. Kurtosis reflects the peakedness of the distribution; a normal distribution has a kurtosis of 3. Positive kurtosis indicates a sharper peak than normal, while negative kurtosis indicates a flatter distribution. For example, the skewness of digital orientation is -0.852, indicating a distribution close to symmetric but slightly skewed to the left. Its kurtosis is 1.987, suggesting a distribution peak and dispersion similar to a normal distribution.

To examine the initial characteristics of the data, descriptive indices for the constructs—including number of items, mean, variance, range, max/min ratio, skewness, and kurtosis—were calculated for the six main constructs. Results indicate that all variables fall within a 1–5 range and exhibit sufficient dispersion for subsequent statistical analyses.

1. Digital Orientation

This construct consists of five items, with a mean of 2.24 and variance of 0.337, indicating an average level among respondents. Negative skewness (-0.852) suggests a tendency toward higher response options, and positive kurtosis (1.987) indicates a relatively tall distribution. The range is 3 (from 1 to 4) and the max/min ratio is 4.00.

2. Digital Capability

This construct also includes five items, with a mean of 2.12 and variance of 0.291, indicating relatively low dispersion. Negative skewness (-0.733) reflects a tendency toward higher values, and positive kurtosis (1.015) indicates a relatively elongated distribution. The range is 3 and the max/min ratio is 4.00.

3. Digital Transformation

Measured with five items, digital transformation has a mean of 1.87, indicating a lower level compared to other constructs. Variance is 0.450, skewness is -0.630, indicating relative concentration toward higher response categories, and negative kurtosis (-0.281) suggests a broader distribution than normal. The range is 4 and the max/min ratio is 5.00.

4. Strategic Agility

This construct consists of six items, with a mean of 2.15 and variance of 0.394. Negative skewness (-0.835) indicates a tendency toward higher values, and positive kurtosis (1.324) suggests a distribution slightly more peaked than normal. The range is 3 (1 to 4) and the max/min ratio is 4.00.

5. Financial Performance

Measured by five items, financial performance has a mean of 2.00 and variance of 0.386. Negative skewness (-0.801) indicates concentration toward higher values, and positive kurtosis (0.731) reflects a slightly flatter distribution relative to other variables. The range is 3 and the max/min ratio is 4.00.

6. Non-Financial Performance

This construct includes five items, with a mean of 2.08 and variance of 0.387. Negative skewness (-0.731)

shows a tendency toward higher response options, and positive kurtosis (0.625) indicates a moderately elongated distribution. The range is 4 and the max/min ratio is 5.00.

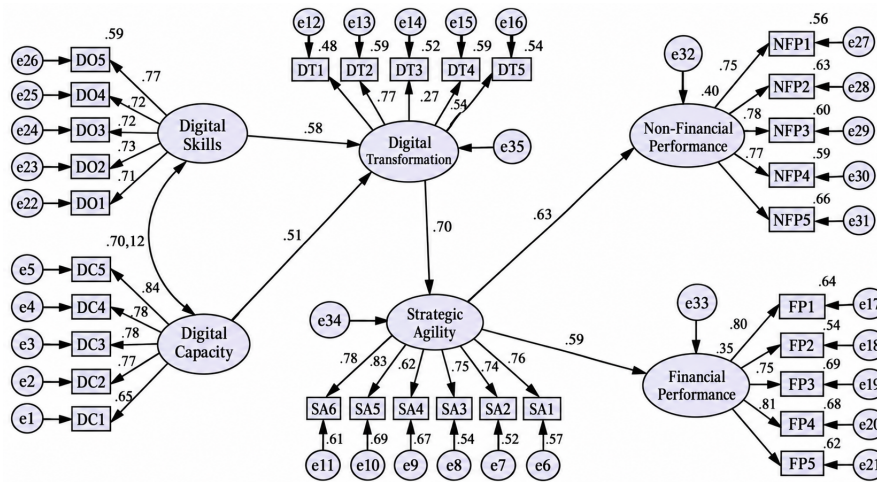


Figure 2: Conceptual model of structural equation research Main hypothesis

For testing the research hypotheses, Structural Equation Modeling (SEM) with the Maximum Likelihood method was employed. Data were collected from 400 respondents. The model fit indices indicated that the proposed conceptual model demonstrated an excellent fit with the empirical data.

Table 5: SEM Model Fit Indices

Index	Obtained Value	Interpretation
CMIN/DF	1.028	<2 → Excellent fit
GFI	0.936	>0.9 → Excellent fit
AGFI	0.926	>0.9 → Excellent fit
CFI	0.998	>0.95 → Excellent fit
TLI	0.998	>0.95 → Excellent fit
IFI	0.998	>0.9 → Excellent fit
RFI	0.934	>0.9 → Excellent fit
RMSEA	0.018	<0.05 → Excellent fit
PNFI / PCFI	0.864 / 0.919	Parsimony indices very good

Based on these fit indices, the conceptual model exhibits an excellent fit with the empirical data. Specifically, an RMSEA of 0.018 and CMIN/DF of 1.028 indicate excellent model fit. Comparative indices such as CFI and TLI, with values above 0.95, further confirm the appropriateness of the model. Overall, the model is validated, allowing path analyses to be conducted.

Table 6: Path Coefficients of the Main Research Variables

Path	Standardized Coefficient (β)	S.E.	C.R.	p-value
Digital Orientation ← Digital Transformation	0.566	0.060	9.387	p < 0.001
Digital Capability ← Digital Transformation	0.463	0.051	9.065	p < 0.001
Digital Transformation ← Strategic Agility	0.762	0.071	10.796	p < 0.001
Strategic Agility ← Financial Performance	0.626	0.061	10.325	p < 0.001
Strategic Agility ← Non-Financial Performance	0.622	0.059	10.483	p < 0.001

To examine the structural relationships among the research variables, SEM was conducted using **AMOS** software. According to the model output, all primary paths were significant, with positive effects consistent with theoretical expectations. The critical ratios (C.R.), standard errors (S.E.), standardized coefficients, and significance levels are reported in the table, all of which support the confirmation of the proposed hypotheses.

Hypothesis 1: Effect of Digital Orientation on Digital Transformation

Results indicate that digital orientation has a positive and significant effect on digital transformation (C.R. =

9.387, $\beta = 0.566, p < 0.001$). This finding suggests that organizations with a clearer digital vision, stronger managerial support, and a more digitally oriented culture achieve higher levels of digital transformation. Hence, **H1a is supported**.

Hypothesis 2: Effect of Digital Capability on Digital Transformation

Digital capability also exhibits a positive and significant effect on digital transformation ($C.R. = 9.065, \beta = 0.463, p < 0.001$). This indicates that technological infrastructure, employee digital skills, and data analytics capabilities play a critical role in accelerating digital transformation. Therefore, **H1b is supported**.

Hypothesis 3: Effect of Digital Transformation on Strategic Agility

Digital transformation significantly strengthens strategic agility ($C.R. = 10.796, \beta = 0.762, p < 0.001$). This finding shows that organizations that digitalize their processes are more capable of sensing environmental changes, making rapid decisions, and reconfiguring resources. Hence, **H2 is supported**.

Hypothesis 4: Effect of Strategic Agility on Financial Performance

Strategic agility has a positive and significant impact on financial performance ($C.R. = 10.325, \beta = 0.626, p < 0.001$). This suggests that agile organizations have greater ability to enhance profitability, productivity, and reduce costs. Therefore, **H3a is supported**.

Hypothesis 5: Effect of Strategic Agility on Non-Financial Performance

Strategic agility also positively and significantly affects non-financial performance ($C.R. = 10.483, \beta = 0.622, p < 0.001$), indicating that organizational agility contributes to improving customer satisfaction, service quality, innovation, and employee engagement. Hence, **H3b is supported**.

Table 7: Standardized Factor Loadings for Construct Items

Factor Loading	Variable
0.767	Digital Orientation
0.750	Digital Orientation
0.768	Digital Orientation
0.782	Digital Orientation
0.836	Digital Orientation
0.756	Digital Capability
0.758	Digital Capability
0.752	Digital Capability
0.820	Digital Capability
0.828	Digital Capability
0.779	Digital Transformation
0.694	Digital Transformation
0.767	Digital Transformation
0.723	Digital Transformation
0.766	Digital Transformation
0.736	Strategic Agility
0.799	Strategic Agility
0.797	Strategic Agility
0.750	Strategic Agility
0.812	Strategic Agility
0.822	Strategic Agility
0.713	Financial Performance
0.698	Financial Performance
0.733	Financial Performance
0.823	Financial Performance
0.767	Financial Performance
0.745	Non-Financial Performance
0.791	Non-Financial Performance
0.777	Non-Financial Performance
0.766	Non-Financial Performance
0.810	Non-Financial Performance

To assess convergent validity, the Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha were calculated. According to the criteria proposed by Fornell and Larcker (1981), AVE should exceed 0.50 and CR should be greater than 0.70. Cronbach's Alpha values above 0.70 indicate acceptable reliability. Based on the results, all constructs exhibit AVE values above 0.50, and CR and Cronbach's Alpha values exceed 0.80.

Table 8: Convergent Validity of Constructs

Result	AVE	Number of Items	Variable
Convergent Validity Confirmed	0.560	5	Digital Orientation
Convergent Validity Confirmed	0.610	5	Digital Capability
Convergent Validity Confirmed	0.544	5	Digital Transformation
Convergent Validity Confirmed	0.613	6	Strategic Agility
Convergent Validity Confirmed	0.634	5	Financial Performance
Convergent Validity Confirmed	0.605	5	Non-Financial Performance

These findings indicate sufficient shared variance among items and strong internal consistency within each construct. Therefore, convergent validity is confirmed for all research constructs.

Table 9: Sobel Test Results for the Mediating Variable

Path	Sobel Z	Result
Digital Transformation $\leftarrow$ Strategic Agility $\leftarrow$ Financial Performance	7.4172	Positive and Significant Mediation
Digital Transformation $\leftarrow$ Strategic Agility $\leftarrow$ Non-Financial Performance	7.5209	Positive and Significant Mediation

The Sobel test was used to examine the mediating role of strategic agility in the relationship between digital transformation and organizational performance. Path coefficients and standard errors were extracted from the structural model output. The results indicate that the indirect effect of digital transformation via strategic agility on financial performance is significant and positive (Indirect Effect = 0.477, S.E. = 0.064, $Z = 7.42$, $p < 0.001$). Similarly, the indirect effect on non-financial performance is also significant and positive (Indirect Effect = 0.474, S.E. = 0.063, $Z = 7.52$, $p < 0.001$).

These results confirm a strong mediating mechanism, suggesting that digital transformation enhances organizational performance—both financial and non-financial—through increased strategic agility. Therefore, the hypotheses regarding the mediating role of strategic agility in the relationship between digital transformation and both dimensions of performance are supported.

5 Discussion and Conclusion

The main objective of this study is to examine the impact of digital orientation on organizational performance with the mediating role of strategic agility in Iran's manufacturing industries (method: structural equation modeling). The findings indicate that digital orientation in Iran's manufacturing industries is at an average level, and with a relative tendency toward higher values, there is growth potential in digital transformation. Based on the data, the mean of 2.24 indicates that organizations are still in the stage of consolidating digital orientation, and the positive kurtosis of the distribution shows that some companies are significantly ahead of others. This result aligns with international studies; research by Rupeika-Apoga et al. [30] has shown that digital orientation and digital capabilities are key drivers of digital transformation in SMEs. Furthermore, Escob Barragan & Becker [14] emphasize that investment in digital orientation, from the perspective of dynamic capabilities, enhances organizational performance. In comparison, the findings indicate that although digital orientation has a positive effect, its average level in Iran hinders the full realization of digital transformation. Therefore, the conclusion is that strengthening digital orientation is a necessary prerequisite for increasing digital transformation and leveraging strategic agility in Iran's manufacturing industries.

Moreover, the findings regarding **digital capability** indicate that this construct in Iran's manufacturing industries is below the average level (mean = 2.12); however, considering the negative skewness, the tendency of responses toward higher values shows that some organizations are moving toward enhancing digital capability. The low variance (0.291) suggests that most companies are in similar positions with little difference among them, while the positive kurtosis of the distribution (1.015) indicates that a few organizations have higher digital capability and can serve as role models. Compared with international studies such as Matt et al. [22] and Warner & Wäger [45], which consider digital capability to include technological infrastructure, human skills, and digital processes as the main driver of digital transformation, these findings indicate the relative backwardness of Iran's manufacturing industries. In fact, while in many countries digital capability is recognized as a key factor for success in digital transformation and strategic agility, the findings show that Iran's manufacturing industries are still at an early stage and require further investment in infrastructure, digital skills, and process redesign to achieve digital transformation. Therefore, the overall conclusion is that enhancing digital capability is an essential prerequisite for successful digital transformation and achieving

strategic agility in Iran's manufacturing industries, and without it, digital orientation and other factors cannot realize their full impact.

The findings regarding **digital transformation** indicate that this construct in Iran's manufacturing industries is at a lower level compared to other variables (mean = 1.87), reflecting the relative weakness of organizations in this area. The variance of 0.450 indicates moderate dispersion of data, and the negative skewness (-0.630) shows that responses are more concentrated toward higher values, meaning that some companies have made efforts to advance digital transformation. Conversely, the negative kurtosis (-0.281) suggests a wider-than-normal distribution, indicating significant differences among companies in the level of digital transformation. The range of 4 and the max/min ratio of 5.00 also indicate a serious gap between leading and lagging organizations in this area. Compared with international studies, research by Kane et al. [17] and Vial [42] emphasizes that digital transformation requires the simultaneous presence of three key factors: digital orientation, digital capability, and organizational agility. The findings indicate that in Iran, although digital orientation and digital capability are at an average level, the low level of digital transformation prevents the full realization of its benefits. Therefore, the overall conclusion is that Iran's manufacturing industries need to make more serious investments in digital transformation to achieve strategic agility and enhance organizational performance, while also reducing the gap between leading and lagging companies.

The findings regarding **strategic agility** indicate that this construct in Iran's manufacturing industries is at a level close to average (mean = 2.15); however, considering the negative skewness (-0.835), respondents tended toward higher values, reflecting organizations' inclination to enhance agility. The variance of 0.394 indicates a relatively limited dispersion of the data, meaning most companies are in similar positions. At the same time, the positive kurtosis (1.324) shows that the distribution of responses is more elongated than normal, and some organizations are significantly ahead of others. The range of 3 and the max/min ratio of 4.00 also indicate a gap between leading and lagging companies in terms of strategic agility. Compared to international studies, research such as Doz & Kosonen [12] and Teece et al. [36] emphasize that strategic agility includes an organization's ability to reconfigure resources, respond quickly to environmental changes, and exploit digital opportunities. The findings indicate that although Iran's manufacturing industries show a tendency to enhance agility, they remain at an average level and require further investment in learning processes, innovation, and organizational structure redesign to achieve digital transformation and superior performance. Therefore, the overall conclusion is that strategic agility in Iran has potential as a mediator between digital orientation and digital transformation, but its full realization requires strengthening infrastructure and organizational culture.

The findings regarding **financial performance** indicate that this construct in Iran's manufacturing industries is slightly below average (mean = 2.00); however, the negative skewness (-0.801) shows that responses tend toward higher values, and some organizations have experienced better financial performance. The variance of 0.386 indicates a relatively limited dispersion of data, meaning most companies are in similar conditions. The positive kurtosis (0.731) reflects a relatively moderate distribution compared to other variables, suggesting that differences among leading and lagging companies in financial performance are smaller than in other constructs. The range of 3 and max/min ratio of 4.00 also indicate the existence of gaps among companies, though these gaps are smaller compared to variables such as digital transformation. Compared to international studies, research such as Bharadwaj et al. [5] has shown that investment in digital capabilities and strategic agility directly enhances financial performance. The findings indicate that in Iran, the low levels of digital transformation and digital capability have kept financial performance at a moderate level. Therefore, the overall conclusion is that enhancing digital orientation, digital capability, and strategic agility can facilitate improved financial performance in Iran's manufacturing industries and reduce the gap between leading and lagging companies.

The findings regarding **non-financial performance** indicate that this construct in Iran's manufacturing industries is at a level close to average (mean = 2.08); however, the negative skewness (-0.731) shows that responses tend toward higher values, and some organizations have performed better on non-financial indicators such as customer satisfaction, service quality, and innovation. The variance of 0.387 indicates relatively limited data dispersion, meaning most companies are in similar positions. The positive kurtosis (0.625) reflects a distribution more elongated than normal and indicates differences between leading and lagging organizations, though these differences are smaller compared to variables such as digital transformation. The range of 4 and max/min ratio of 5.00 also show the existence of gaps among organizations. Compared to international studies, research such as Chong et al. [10] emphasizes that non-financial performance (including innovation, quality, customer satisfaction, and organizational learning) plays a key role in enhancing financial performance and organizational sustainability. The findings indicate that although Iran's manufacturing industries are at an average level, they have potential to improve non-financial performance, which can also facilitate improvements in financial performance and digital transformation. Therefore, the overall conclusion is that focusing on non-financial indicators, particularly customer satisfaction and innovation, can pave the

way for achieving strategic agility and sustainable performance in Iran's manufacturing industries.

The overall summary of the research findings shows that Iran's manufacturing industries are still at a moderate or lower level in the digital transformation process. Digital orientation and digital capability, although positively influential, due to their moderate level, prevent the full realization of digital transformation. Digital transformation, compared to other constructs, is weaker, increasing the gap between leading and lagging companies. Strategic agility has potential as a mediator but requires investment in learning, innovation, and organizational culture. Organizational performance, both financial and non-financial, remains at a moderate level and is highly dependent on enhancing digital capabilities and strategic agility. Therefore, the final conclusion is that strengthening digital orientation and digital capability along with developing strategic agility is a critical prerequisite for successful digital transformation and improved organizational performance in Iran's manufacturing industries.

The following recommendations are proposed in this regard:

1. **Develop a Comprehensive and Forward-Looking Digital Strategy:** Organizations should have a clear and long-term digital vision so that digital orientation can act as the main driver of digital transformation. This strategy should be accompanied by leadership commitment and alignment with the organization's overall goals.
2. **Targeted Investment in Digital Capabilities:** Strengthening technology infrastructure, developing employees' digital skills, and establishing data-driven systems are essential. The low digital capability in Iranian industries is the main barrier to fully achieving digital transformation.
3. **Enhance Strategic Agility Through Structural Redesign:** Organizations should redesign their processes to respond more quickly to environmental changes. Establishing a culture of continuous learning and innovation turns agility into a sustainable capability.
4. **Simultaneous Focus on Financial and Non-Financial Performance:** In addition to financial indicators, attention to customer satisfaction, service quality, innovation, and organizational intellectual capital is essential. These non-financial indicators provide the foundation for long-term financial improvement.
5. **Develop a Localized Digital Transformation Model for Iran's Manufacturing Industries:** Given resource constraints and institutional weaknesses, a localized model should be designed that simultaneously considers digital orientation, digital capability, and strategic agility, providing a practical pathway to improve organizational performance.

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