

# The Relationship between IT Integration, Organizational Culture, and Supply Chain Performance

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## Abstracts

IT integration plays an important role in boosting supply chain performance (SCP) in today's dynamic organizational environment. It becomes easier for real-time data sharing, collaboration, and communication among supply chain participants. However, the prevailing organizational culture has a considerable impact on how effective IT integration exists, as it can either help or hinder the adoption and exploitation of IT integration. The relationship between SCP, organizational culture, and IT integration is examined in this study. Measurement model assurance and research hypothesis examination are accomplished through the use of structural equation modeling (SEM). 90 manufacturing firms are surveyed for this research online. This analysis employs regression analysis and an ANOVA test that confirms the significant correlation between IT integration, organizational culture, and SCP. The results and findings show that supply chain performance and IT integration are positively correlated, highlighting the fact that the impact of IT integration is increased by an encouraging organizational culture that values adaptability, teamwork, and continuous learning. ( $\beta=0.50, 0.45, 0.35$ , and  $0.30, p<0.001$ ) provide strong evidence in favor of hypotheses 1–4. The study finds that SCP is greatly improved by successful IT integration, but the effectiveness of the integration is heavily dependent on an organizational culture that encourages flexibility and teamwork.

**Keywords:** IT integration, organizational culture, Structural equation modeling (SEM), supply chain performance, manufacturing firms.

## Introduction

A well-developed organizational culture is a great way to inspire staff members. Continuous and dedicated work to improve organizational culture inspires workers to be more committed to their jobs, work as a team, and produce higher-quality goods and services, which boost overall business success [11]. The characteristics of organizational culture impact employee behavior and teamwork, which in turn influences employee team commitment to enhance business quality and establish and preserve enduring connections with vendors and clients, as well as coordination and teamwork between organizational components of the company [12].

A few well-known, prosperous construction companies have wisely moved away from the traditional "construction only" business strategy. These progressive construction companies have actually reached their full potential by breaking with traditional norms. This is a dangerous shift that entails a culture shift [8]. By expanding their markets and areas of operation, many organizations have found new life because of reforms. It has been found that one of the crucial factors affecting a business' efficacy and production is its organizational culture (OC) [16].

By cultivating and maintaining a culture that prioritizes continual performance improvement, businesses can greatly increase their efficiency and thus favorably impact the construction industry. Employee innovation, excellence, and adoption of best practices are encouraged in the culture, which eventually improves project outcomes, lowers costs, and accelerates schedules [7]. By giving priority to these components, businesses can guarantee that their employees stay engaged and motivated. Furthermore, encouraging teamwork and knowledge exchange could result in the development of creative solutions and enhanced project management techniques [9].

The term IT integration describes how information systems and technology are seamlessly incorporated into different organizational processes to enhance decision-making, communication, and data sharing [15]. IT integration is very important for SCM because it allows for real-time data interchange, improves transparency, and maximizes coordination of activities throughout the network. It is more likely that an innovative, cooperative, and adaptable culture can successfully incorporate IT technologies and produce improved SCP [1]. The performance of SCP in manufacturing companies is examined in this study in relation to organizational culture and IT integration.

The remaining aspects of the study are organized into distinct sections to provide a comprehensive overview of the research. Section 2 presents the relevant work, reviewing existing literature and foundational studies that contextualize the current research. In section 3 various approaches are examined, detailing the methodologies and techniques employed in the research. Section 4 presents the experimental findings, offering an analysis of outcomes and their effects. Section 5 effectively concludes the paper, highlighting the most important findings, explaining about the findings' relevance, and making suggestions for possible further study areas.

## Related works

In manufacturing organizations, the study [13] examined the link between organizational flexibility and supply chain agility, as well as the benefits of organizational adaptability and environmental unpredictability on SCI. The findings showed a substantial correlation between SCI, such as environmental uncertainty, and the integration of suppliers, customers, and internal processes. The integration of the supply chain and organizational ambidexterity were significantly correlated. They examined how IOS usage impacts the organization's SCM and SCP in the research [2]. Utilizing information from 193 participants that represented a range of fast-moving consumer goods creators and distributors, they validated every hypothesis presented in the study model. The findings indicated the enhancing function that SCM capabilities play as a mediator as well as the dual impact of IOS adoption in enhancing operational SCP. As the fundamental component of organizational sustainability, research [17] on the mechanisms facilitating innovation deserves to be beneficial to both practitioners and scholars. It led to a rise in demand for additional study that looks into the factors that influence innovativeness. The CVF concept provided a useful framework for establishing rules that can encourage creativity inside the company. The CVF model focused on how workers behaved and how the culture of the company is managed. Investigating the link between efficacy, flexibility, and integration was the main goal of the study [5]. In the highly competitive global market, SCI and flexibility were acknowledged as critical business practices and competencies. According to the mediation analysis, logistical flexibility modifies the connection between supplier and customer cooperation and SCP in part and entirely, respectively.

To enhance operational performance, the research [10] examined the connection between SCI and SCRM. According to the report, SCRM benefits from internal, provider, and customer collaboration based on data from 931 manufacturing companies. Whereas SCRM completely mediates the relationship between vendor and consumer integration, it only modifies the link between operational efficiency and internal integration to some extent. It investigated how supply chain agility, resiliency, internal collaboration, and partnerships affect sustainable advantage [14]. Questionnaires were used to gather data from Indonesian manufacturing enterprises, and the responses validated all nine of the assumptions. It was discovered that sustainability was improved through supply chain partnerships, agility, adaptability, and internal integration. Resilience was also enhanced by supply chain agility, which maintains manufacturing processes and controls capacity. The results provided managers with knowledge to improve sustainable advantage in the industrial sector. It investigated the connection between manufacturing businesses' levels of integration and innovative capacities while taking servicing into account [3]. The study employed partial least squares SEM to identify the effect of customer integration on the capacity for creation innovation, and the results indicated notable distinctions between low- and high-level services. It was to evaluate a conceptual model that examines the relationship between organized retailing companies' performance in India and DDSCQMP [6]. The study offered empirical support for a structural model and, using the context of India's organized retail industry, found a positive and substantial connection between DDSCQMP and organizational success. It looked at how organizational performance (OP) and the components of OC relate to one another in the study [4], with an emphasis on innovation's mediating function. The findings showed that while OC and creativity have a distinct and beneficial impact on an OP's, an

organization's mission and OC have little influence on its achievement when innovation was presented. The results showed how fostering an inventive culture inside an organization can facilitate the application of innovation, which could lead to improved OP.

### Research Hypothesis

Hypothesis (H1): IT integration shows a significant association in the SCP (IT integration → SCP).

Hypothesis (H2): Organizational culture shows a significant correlation in the SCP (Organizational culture → SCP).

Hypothesis (H3): IT integration moderates the relationship between organizational culture and SCP (IT integration → Organizational culture → SCP).

Hypothesis (H4): Organizational culture moderates the connection between IT integration and SCP (Organizational culture → IT integration → SCP).

### Methodology

The conceptual framework of the research and the interactions between the variables under consideration are shown in Fig 1. SCP is the dependent variable in this framework, organizational culture and IT integration are the independent factors influencing performance. IT integration includes systems and technology developments that improve communication and enable real-time data sharing within the network. The ideals and procedures that influence how well IT integration is embraced and used are reflected in organizational culture.

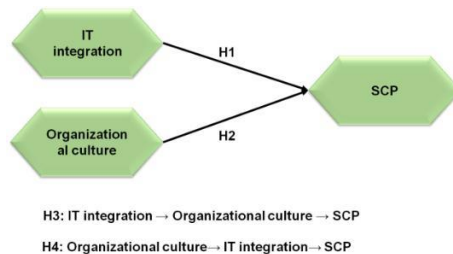


Fig 1 Conceptual framework

### Samples

Initially, 480 manufacturing enterprises were surveyed for the study. 250 of these organizations consented to participate and were provided with online questionnaires. Of them, 60 had incomplete responses, and 100 had no response at all. Thus, after taking these problems into consideration, the survey finally contained 90 completed and returned questionnaires. The final

response rate and research participation are reflected in this sample of 90 firms, which serves as a representation of the data used for analysis. Table I and Fig 2 show the demographic data.

Table I Demographic table

Demographic variable	categories	Sample size (n)	Percentage (%)
Industry	Manufacturing	40	44.44
	Retail	35	38.89
	Technology	15	16.67
Company size	Small (1-50 employees)	25	27.78
	Large (200+ employees)	25	27.78
	Medium (51- 200 employees)	40	44.44
IT integration level	low	20	22.22
	Medium	40	44.44
	High	30	33.33
Organizational culture	Collaborative	35	38.89
	Hierarchical	25	27.78
	Innovative	15	16.67
	Traditional	15	16.67

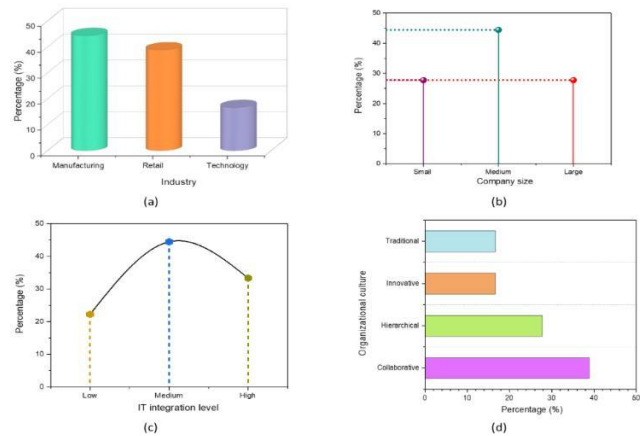


Fig 2 Sample data (a) Industry (b) Company size (c) IT integration level (d) organizational culture

Research instrument

The opinions of companies were gathered for the study using an online survey. Each of the survey's 15 questions was created to gather responses on a 5-point Likert scale. Individuals were provided with a scale that indicates how much respondents disagree or agree with each statement,

ranging from "strongly disagree" to "strongly agree". This method offered an in-depth understanding of the experiences and opinions of the firms while making it simpler to collect data in an organized way. The well-organized technique allowed for the quantification of the feedback, which complemented the study findings with important qualitative data. This made it possible to carefully compare and contrast all of the responses.

#### Method for data analysis

In this study, SPSS version 29.0 is used for quantitative analysis to conduct a complete examination of the impacts on organizational culture and IT integration on SCP. Using SEM to test this study assumptions and the measurement model was efficient. It is able to methodically validate the relationships between organizational culture and IT integration, two independent factors, and how the SCP was impacted by both. The objective of exploring these relationships was to offer a more profound understandings of the way in which technological integration and organizational characteristics work together to affect SCP.

### Results and findings

ANOVA, regression analysis and SEM are the connections between organizational culture, IT integration and SCP.

#### ANOVA test

The connections between SCP, organizational culture, and IT integration are tested, and the results are shown in table II. The H1 examines how SCP is directly impacted by IT integration, and the result demonstrates a significant positive influence with an F-statistic of 8.00 ( $p=0.006$ ). An F-statistic of 9.00 ( $p=0.003$ ), which is also significant, is obtained from the H2, which looks at how organizational culture affects supply chain performance. H3 has an F-statistic of 5.60 ( $p=0.015$ ) indicating partial mediation, examines the mediated relationship where IT integration influences SCP through organizational culture. In H4, the impact of organizational culture on SCP through IT integration is tested for reverse mediation. The results reveal a statistics of 4.75 ( $p=0.025$ ), indicating a significant but weaker mediated effect. Overall, the findings imply that corporate culture and IT integration are significant variables that both directly and indirectly impact supply chain performance.

Table II ANOVA test

Hypothesis	SS	df	MS	F-statistics	p-value
H1: IT integration → supply chain performance	120	1	120	8.00	0.006
H2: Organizational culture → supply chain performance	135	1	135	9.00	0.003
H3: IT integration → Organizational culture → supply chain performance	110	2	55	5.60	0.015
H4: Organizational culture → IT integration → supply chain performance	95	2	47.50	4.75	0.025

## Regression analysis

The regression analysis findings for the four hypotheses (H1 to H4) are presented in table III. A number of metrics are used to assess each hypothesis, including t-statistics, F-statistics, coefficient, standard error,  $R^2$ , adjusted  $R^2$ , and p-value for the coefficient. For each hypothesis, the  $R^2$  values show the percentage of the dependent variable's volatility that the independent variable measures with values ranging from 0.40 to 0.62. The adjusted  $R^2$  values take into consideration the number of predictors in the model and are marginally lower but still substantial. The models are statistically significant, as evidenced by the strong F-statistics and p-values less than 0.001. The coefficients show the predictor's effect size, which ranges from 0.35 to 0.60. The corresponding t-statistics and p-values demonstrate the statistical significance of these effects ( $p < 0.001$ ).

Table III Regression analysis

Hypothesis	$R^2$	Adjusted $R^2$	p-value	F-statistics	Standard error	Coefficient	p-value	t-statistics
H1	0.45	0.44	<0.001	50	0.09	0.60	<0.001	6.67
H2	0.40	0.39	<0.001	45	0.11	0.55	<0.001	5.00
H3	0.55	0.53	<0.001	60	0.09	0.40	<0.001	4.44
H4	0.62	0.59	<0.001	70	0.08	0.35	<0.001	4.38

## SEM

Table IV displays the findings of a statistical investigation into the connections among SCP, organizational culture, and IT integration. Each relationship's strength is shown by the coefficients ( $\beta$ ). Better IT integration appears to improve SCP, as demonstrated by the positive and significant impact IT integration has on SCP ( $\beta = 0.50$ ,  $t = 6.25$ ,  $p < 0.001$ ). Supply chain performance is also considerably enhanced by organizational culture ( $\beta = 0.45$ ,  $t = 6.43$ ,  $p < 0.001$ ). Furthermore, it was observed that SCP is indirectly impacted by IT integration through organizational culture ( $\beta = 0.35$ ,  $t = 7.00$ ,  $p < 0.001$ ). This suggests that a robust organizational culture could act as an intermediary between SCP and IT integration. However, there is an intersection between these variables as organizational culture influences IT integration, which impacts SCP ( $\beta = 0.30$ ,  $t = 5.00$ ,  $p < 0.001$ ). With p-values less than 0.001, all associations are significant and provide compelling evidence for the effects that are described. Fig 3 shows the SEM evaluation.

Table IV SEM analysis

Hypothesis	Coefficients ( $\beta$ )	Standardized error	t-value	p-value	Significance
IT integration $\rightarrow$ SCP	0.50	0.08	6.25	<0.001	Significant
H2 Organizational culture $\rightarrow$ SCP	0.45	0.07	6.43	<0.001	Significant
IT integration $\rightarrow$ Organizational culture $\rightarrow$ SCP	0.35	0.05	7.00	<0.001	Significant
Organizational culture $\rightarrow$ IT integration $\rightarrow$ SCP	0.30	0.06	5.00	<0.001	Significant

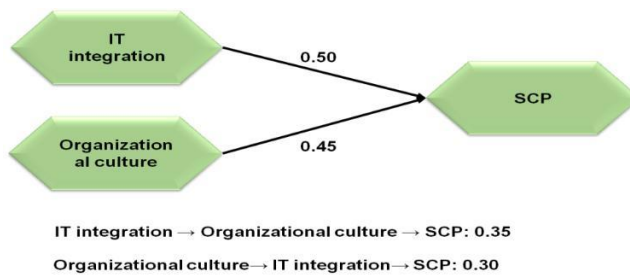


Fig 3 Evaluation of the SEM

## Conclusion

Study focuses on the connection between SCP, IT integration, and organizational culture. Measurement model assurance and research hypothesis examination are accomplished through the use of SEM. For this study, 90 manufacturing companies are surveyed online. Regression analysis and the ANOVA test, which used in the analysis, shows a strong link between SCP, organizational culture, and IT integration. The results shows that supply chain effectiveness and IT integration are positively correlated, highlighting the idea that an agile organization, teamwork, and continuous growth enhance the impact of IT integration. ( $\beta = 0.50, 0.45, 0.35$ , and  $0.30$ ,  $p < 0.001$ ) providing well support for hypothesis 1 to 4. Self-reported data is a limitation of this study, which raises the possibility of bias in the evaluation of organizational culture and IT integration. To provide a more unbiased assessment of the effect of IT integration on SCP across a range of industries, future study could examine longitudinal studies and include quantitative indicators.

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