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Collaborative Supply Chain Management in the Sharing Economy: An Empirical Research

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ABSTRACT

This study examines the impact of the sharing economy on collaborative supply chain management among Turkish international trade firms. The sharing economy, which involves temporary access to underutilized resources via digital platforms, has challenged traditional supply chain models, necessitating resilient and flexible collaborations. The research utilizes the Inter-organizational Relationships (IOR), Unified Theory of Acceptance and Use of Technology (UTAUT), and Resource-Based View (RBV) frameworks, highlighting dynamic capabilities. Through structural equation modeling (SEM) and expert interviews, the findings reveal that trust and information sharing are essential, but their effects on e-collaboration are complex. Trust negatively correlates with e-collaboration, indicating that electronic platforms may mediate trust in low-trust environments. On the other hand, performance expectancy and facilitating conditions significantly boost e-collaboration adoption. The study identifies e-collaboration as a dynamic capability, improving operational performance, customer/supplier satisfaction, growth, and profitability. This research contributes theoretically by integrating organizational and individual perspectives on e-collaboration and elucidates the intricate relationships between trust, information sharing, and technology in supply chains. Practical recommendations are provided for leveraging technological innovations to enhance trust and information sharing in collaborative supply chains.

Keywords: Collaborative supply chain management, e-Collaboration, Sharing economy, Structural Equation Modeling.

JEL Classification Codes: C12, L21, M10

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INTRODUCTION

Traditional business models consist of companies that produce goods or services, market them to potential customers, and deliver them through a distribution channel in exchange for a profit. (Demary, 2014). The underutilization of economic resources, environmental assets and social capital presents a significant obstacle in modern economies (Schor et al., 2015; Shmidt, 2023). The sharing economy surpasses the traditional supplier model by unlocking access to underutilized resources and redefining the concepts of access, ownership, and employment (Ferrel et al., 2017; Öberg, 2024). Income is obtained through temporary access to a service or product rather than product ownership (Daunoriene et al., 2015).

Revolutionized by the internet, the sharing economy introduces innovative business models grounded in disruptive technologies, promoting resource sharing over individual ownership and enabling businesses to act as both suppliers and customers. This shift has been further driven by global economic crises and growing skepticism towards capitalism, leading consumers to embrace ethical and sustainable consumption patterns (Banning, 2016; Hairam et al., 2023). Consequently, changes in societal values and the influence of digital platforms have propelled the sharing economy into widespread popularity (Cheng and Edwards, 2017).

The sharing economy, also known as the collaborative or platform economy, is a marketplace that connects users with temporary access to a vast pool of crowdsourced resources, both tangible and intangible, enabling actors like consumers and organizations to participate in the life-cycle use of products while leveraging technology for scalability (Eckhardt et al., 2019; Lim, 2020; Tham et al., 2023). Despite the ongoing debates about its advantages, including resource efficiency, community building, and access over ownership, as well as its drawbacks related to labor rights, regulatory challenges, and unequal distribution of benefits (Schor, 2021), the sharing economy model, shaped by social, technological, economic, and legal factors, has the potential to cultivate

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a collaborative and sustainable society (Heinrichs, 2013; Cohen and Kietzmann, 2014). It achieves this by disrupting traditional seller-buyer dynamics by enabling direct consumer interaction and shared utilization of underutilized assets and circumventing certain traditional supply chain processes through peer-to-peer platforms, thus creating a marketplace where resources are shared, maximizing their use, and reducing waste (Scaraboto, 2015; Frenken and Schor, 2017; Schor and Attwood-Charles, 2017; Tham et al., 2023).

Traditional supply chains are siloed and risk-averse, struggling to adapt. Collaborative models, where risks and rewards are shared, offer a more resilient, long-term and value-driven approach (Simatupang and Sridharan, 2005; Pramatari, 2007; Camarinha-Matos et al., 2024). Collaborative supply chain management reduces costs and enhances flexibility in the face of uncertainties (Vachon and Klassen, 2006; Carter and Rogers, 2008), collaborative innovation and supply chain agility (Al-Omoush et al., 2023). Globalization and information technology spurred the collaborative supply chain approach (Bowersox, 1990; Barratt, 2004; Rust and Espinoza, 2006; Hrouga, 2023), with digitalization lowering costs and enabling new models (Bloom et al., 2014; Lusch and Nambisan, 2015).

However, short-term negative returns on technology investments can hinder collaboration (Richey et al., 2010). Establishing healthy collaborations can be challenging due to cultural and structural barriers (Fawcett et al., 2012a; Govindan and Jha, 2023). It requires collaboration among independent businesses to reach shared objectives, decrease expenses, and improve service levels, relying on trust-based partnerships to align supply chain activities and overhaul traditional business processes (Sheu et al., 2006; Fawcett et al., 2008; Olorunniwo and Li, 2010; Richey et al., 2012; Submitter et al., 2021). Successful collaboration requires nurturing a culture of collaboration, promoting transparent information sharing, risk sharing, and harnessing innovative information technologies (Barratt, 2004; Simatupang and Sridharan, 2005; Cao and Zhang, 2011; Soosay and Hyland, 2015; Acquah, 2023).

The existing literature extensively explores how technological innovations can enhance collaborative supply chain management (Wuni and Shen, 2021; Wei, 2023). While highlighting the benefits of these innovations in promoting collaboration, the literature also underscores significant challenges, limitations, and gaps (Kamble et al., 2020; Cui et al., 2023; Kumari et al., 2023; Chen, 2024). Thus, further investigation is warranted into the barriers hindering effective implementation and the dynamics of technology diffusion within collaborative supply chains. This dual perspective underscores the complex nature of leveraging technology to foster collaboration in supply chains, acknowledging both promising benefits and persistent practical hurdles.

This study seeks to address this gap by examining the intersection of collaborative supply chains with the sharing economy. The sharing economy, characterized by digital platforms facilitating temporary access to underutilized resources, poses challenges to traditional supply chain models and necessitates more resilient and adaptable collaborative partnerships. Specifically focusing on Turkish international trade firms, this research employs quantitative methods and interviews with information technology company founders to explore the sharing economy's impact on collaborative supply chains. The article is structured as follows: it begins with a conceptual framework and hypotheses derived from an extensive literature review. Subsequently, the research methodology is delineated, followed by a comprehensive data analysis incorporating findings from structural equation modeling (SEM). Finally, the article concludes with a discussion that interprets the results, underscores theoretical and managerial implications, and outlines avenues for future research.

CONCEPTUAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

Inter-organizational Relationships (IOR)

Amid resource constraints and the accelerating pace of technological advancement and globalization, the demand for adaptability, innovation, and operational efficiency has grown significantly. This heightened need underscores the critical role of inter-organizational relationships and transactions within relational networks (Oliver, 1990; Chong et al., 2009; Chan et al., 2012). The core principle of this approach is its emphasis on the dynamics of organizational relationships, where each entity maintains autonomy and protects its own interests yet collaborates toward achieving mutual goals. (Cropper et al., 2008).

Inter-organizational relationships flourish through the continuous exchange of valuable technical, administrative, and logistical resources, fostering mutual benefits and leading to the institutionalization of long-term partnerships (Johnsen et al., 2008). Sustaining these relationships and demonstrating mutual commitment necessitates building trust, sharing information, and

strengthening partnerships, which significantly influence inter-organizational interactions and their performance outcomes (Panteli and Sockalingam, 2005; Cai et al., 2013; Chen et al., 2014; Skipworth et al., 2015; Huong Tran et al., 2016; Qian et al., 2020; Adaku and Amanor-Boadu, 2022).

Trust

Trust, the belief in a partner's competence and integrity (Connelly et al., 2018), is fundamental to effective collaboration within supply chain management (Chen et al., 2014). It serves as a critical mediator in inter-organizational relationships (IORs), mitigating opportunistic behaviors and fostering a more collaborative environment (Yu, 2018). Beyond enhancing cooperation, trust cultivates a shared commitment to common objectives, which is essential for maintaining long-term partnerships. TMoreover, trust plays a vital role in managing the complexities inherent in IORs. Högberg and Sköld (2023) illustrate how boundary spanners navigate these complexities, shaping and reinforcing trust within these relationships. This highlights the importance of understanding the contextual factors influencing trust dynamics, as organizations must continuously adapt their strategies to sustain trust while managing diverse expectations and external pressures.

In an inter-organizational context, trust fosters collaboration (Goffin et al., 2006; Tsanos and Zografos, 2016), information sharing, and innovation (Ammeter et al., 2004; Cheng, 2011; Hoejmose et al., 2012; Jen et al., 2020; Wang and Schweizer, 2023). Establishing trust among supply chain members is vital for realizing mutual benefits; it decreases transaction costs, cultivates loyalty, and diminishes uncertainty, while its absence fosters inefficiencies and undermines performance (Fawcett et al., 2012b; Yang, 2014; de Oliveira and Rabechini, 2019; Yang et al., 2019; Han et al., 2021; Adomako and Nguyen, 2023). In this direction, it is assumed that the relationship to be established between supply chain members based on trust will have a positive impact on the parties' e-collaboration adaptation process.

H1: Trust positively impacts the adoption of e-collaboration within supply chains.

Information Sharing

Enhancing organizations' access to new knowledge, information sharing plays a pivotal role (Chen et al., 2014). In collaborative supply chains, it ensures smooth business processes and adaptation to innovations (Zeiringer and Thalmann, 2021), focusing on common goals, seizing market opportunities, and enhancing value-added processes (Shih et al., 2012). Secure sharing among members is crucial for resource coordination and process integration, boosting agility, performance, adaptability, and resilience (Kim et al., 2012; Shih et al., 2012; Panahifar et al., 2015; Mishra et al., 2018; Sugito and Kusrini, 2023). It also encourages innovative practices (Zhou and Benton, 2007), with small and medium-sized enterprises more likely to adopt electronic processes when critical information is shared (Chong et al., 2009). The utilization of information technologies for facilitating information sharing has been steadily expanding (Chen et al., 2014), with e-collaboration playing an increasingly prominent role in supply chains. E-collaboration enables more efficient and effective information sharing (Choi and Ko, 2012; Hoove-Sibanda and Pooe, 2018; Zeng and Yi, 2023), leading to the assumption that an effective and well-managed information-sharing process between organizations within the supply chain will positively influence the adaptation of e-collaboration among supply chain members.

H2: Effective information sharing positively impacts the adoption of e-collaboration within supply chains.

Partner Power

*Power within a supply chain de*notes the capability of one member to influence the behavior and decisions of others (Yeung et al., 2009), directly affecting operational performance (Ke et al., 2009; Liu et al., 2010; Morgan et al., 2018) and the outcomes of collaboration (Cuevas et al., 2015; Huo et al., 2019). In interconnected supply chains, the decisions of one member have repercussions on the performance of others (Moldoveanu and Baum, 2011). Dominant members hold the ability to uphold supply chain security and sustainability by insisting on critical information sharing and establishing contracts focused on building trust (Muthusamy and White, 2005; Chen et al., 2014). Recent research (Krczal and Behren, 2024; Reynolds, 2024; van Oijen et al., 2024) has demonstrated that the constructive use of power generates benefits across the entire supply chain. Considering these findings, it is assumed that partner power is a key factor influencing the adoption of e-collaboration within supply chains.

H3: The influence of partners' power positively impacts the adoption of e-collaboration within supply chains.

Unified Theory of Acceptance and Use of Technology

Developed by Venkatesh et al. (2003), UTAUT identifies key factors that predict behavioral intentions toward technology use, especially in organizational contexts (Venkatesh et al., 2012). The UTAUT model posits that performance expectancy, effort expectancy, and social influence influence behavioral intention to use technology, while facilitating conditions and behavioral intention drive actual technology use, with gender, age, experience, and willingness to use serving as moderating variables (Venkatesh et al., 2016). In line with previous studies (Dabliz et al., 2021; Engku Hassan Ashari et al., 2023), it is evident that the relevance of specific variables may vary depending on the study context, leading to the addition or removal of certain factors when applying the model. In this study, the key variables of the UTAUT model—performance expectancy, effort expectancy, social influence, and facilitating conditions—are assessed as critical determinants influencing the acceptance of e-collaboration within supply chains.

Performance Expectancy

*Performance expectancy, the belief that using a technology improves job performance, is the strongest factor determining user adoption (Venkatesh et al., 2003:447; Venkatesh et al., 2012). Research consistently identifies performance expectancy as the strongest predictor of users' willingness to adopt a new technology (Venkatesh et al., 2012; Sumak and Sorgo, 2016). Research has consistently shown that performance expectancy plays a crucial role in influencing employees' willingness to adopt and use different technological tools (Chauhan and Jaiswal, 2016; Cimperman e*t al., 2016; Hoque and Sorwar, 2017; Cao and Niu, 2019; Chao, 2019; Queiroz and Wamba, 2019; Avcı, 2022).

Jain et al. (2022) investigated the adoption of blockchain enabled e-commerce platforms, finding that consumers are primarily driven by their perceived advantages these platforms offer compared to traditional methods. Kapnisis et al. (2022) studied Greek bulk shipping companies and found a positive relationship between performance expectancy and the intention to adopt blockchain technology, suggesting that as employees' expectations for improved job performance increase, so does their willingness to embrace it. Another study analyzing the factors influencing the acceptance and use of distance education systems among medical educators in Turkey during the COVID-19 pandemic found significant positive effects of performance expectancy (Çiftçi et al., 2023). Based on the literature, this study predicts that employees who believe e-collaboration tools will enhance their job performance will be more likely to adopt and use them.

H4: Performance expectancy positively impacts the adoption of e-collaboration in supply chains.

Effort Expectancy

*Effort expectancy refers to the level of ease associated with using a technology (Venkatesh et al., 2003:450). It has consistently demonstrated a positive impact on intentions to use technology across diverse contexts (Boontarig et al., 2012; Sun et al., 2013; Chauhan and Jaiswal, 2016; Cimperman et al., 2016; Hoque and Sorwar, 2017; Cao and Niu, 2019; Chao, 20*19).

Shaikh and Amin (2023) examined the factors affecting bank customers' acceptance of financial technologies. Effort expectancy was the most influential variable after performance expectancy. Zhang et al. (2023) explored blockchain adoption in operations and supply chain management in Pakistan, revealing that perceived ease of use enhances users' intention to adopt the technology. VanDerSchaaf et al. (2023) investigated the main determinants of student information technology adoption and found that effort expectancy has a significant impact. Based on the literature, it is suggested that when employees perceive themselves as proficient in using such systems, this self-assessment is likely to enhance their adaptation to e-collaboration.

H5: Effort expectancy positively impacts the adoption of e-collaboration in supply chains.

Social Influence

*Social influence, comprising subjective norms, social factors, and image, denotes the perception that influential individuals expect technology usage, significantly impacting user adoption (Venkatesh et al., 2003:451). Studies have consistently demonstrated its positive correlation with the adoption of diverse technologies (Sumak and Sorgo, 2016; Ahmad and Kh*alid, 2017; Hoque and Sorwar, 2017; Khalilzadeh et al., 2017; Zhang et al., 2018; Queiroz and Wamba, 2019).

Yang et al. (2022) investigated the effects on older adults' smartphone usage intentions and behaviors. Social influence was found to significantly affect behavioral intention and attitude towards smartphone use. Zhang et al. (2023) confirmed a strong positive correlation between social influence and the intention to adopt blockchain technology, indicating that encouragement from colleagues enhances adoption likelihood. Kapnisis

et al. (2022) noted that shipping company employees recognized the necessity of adopting blockchain to remain competitive, as many industry peers had already implemented it. Based on the literature, it is suggested that employees will be positively influenced by their work environment and peers in adopting e-collaboration tools, facilitating a smoother adaptation to e-collaboration.

H6: Social influence positively impacts the adoption of e-collaboration in supply chains.

Facilitating Conditions

Facilitating conditions refer to users' users' perceptions of the available resources and support for performing a specific behavior, encompassing beliefs about the existing organizational and technical infrastructure that enables technology use (Venkatesh et al., 2003). Research suggests that robust technological infrastructure plays a significant role in facilitating technology adoption (Oliveira et al., 2014; Chauhan and Jaiswal, 2016; Cimperman et al., 2016; Sabi et al., 2016; Sumak and Sorgo, 2016; Queiroz and Wamba, 2019).

Jain et al. (2022) showed that facilitating conditions significantly influence the intention to adopt blockchain-enabled e-commerce platforms. Similarly, another study on online education adoption found that facilitating conditions positively affect both individuals' behavioral intentions and actual usage behaviors (Tahir, 2023). Drawing from this literature, it is suggested that adequate technical infrastructure and organizational support will positively influence the adaptation process to e-collaboration.

H7: Facilitating conditions positively impacts the adoption of e-collaboration in supply chains.

Resource-Based View (RBV) and Dynamic Capabilities

The RBV h emphasizes the importance of a firm's core competencies and dynamic capabilities, identifying valuable, rare, inimitable, and non-substitutable resources as strategic assets (Barney, 1991). Supply chain collaboration exemplifies such a resource that fosters competitive advantage, while information technology resources function as strategic tools that enhance firm performance (Wu et al., 2006; Al-Khatib and Valeri, 2022). The RBV framework enables firms to cultivate dynamic capabilities that align with their strategic objectives (Budidarma, 2022; Yi et al., 2023; Wu and Ku, 2024). Dynamic capabilities, defined as advanced skills, enable firms to integrate, develop, and reconfigure both internal and external resources to adapt to rapidly changing market conditions. Collaboration brings together these resources to create customer value (Teece, 2012; Mukhtar et al., 2023). In supply chains, the core principle of collaboration is building relationships between parties to foster dynamic capabilities (Kumar et al., 2018; Lyu et al., 2023). They, strengthened through collaboration, enhance supply chain performance and drive accelerated growth (Baah et al., 2021; Zhang et al., 2023). As supply chains become increasingly complex and data-driven, traditional processes are shifting from conventional forms (Zeiringer and Thalmann, 2021). E-collaboration, in particular, has transformed business operations by reshaping inter-organizational processes (Alsaad et al., 2018; Nezami et al., 2023), enabling information sharing, joint decision-making, and process integration (Johnson and Whang, 2002; Thomassen, 2024). In response, firms are adopting e-collaboration as a dynamic capability, aligning their processes with those of other organizations to gain a competitive edge, improve customer satisfaction, and boost overall supply chain efficiency (Alsaad et al., 2014; Trebilcock, 2015; Panahifar et al., 2018; Shahadat et al., 2023).

The significance of e-collaboration is increasing, especially in coordinating and cooperating within international trade, where cultural and geographical distances pose challenges (Jean et al., 2014; Genhua, 2023). To capitalize on this trend, organizations have made significant investments in information technologies (Colicchia et al., 2018) , using e-collaboration as a strategic tool to gain a competitive edge in global markets (Jen et al., 2020). E-collaboration enhances the supply chain's responsiveness to market demands by facilitating the exchange of critical information (Rosenzweig, 2009; Guo, 2023). This results in higher sales, improved operational performance, enhanced customer satisfaction, greater resilience to disruptions (Cao and Zhang, 2011; Ko et al., 2011; Lu and Al-Hakim, 2016; Kareem and Kummitha, 2020; Tukamuhabwa et al., 2021), and overall improved supply chain performance (Ardyan et al., 2018; Hoove-Sibanda and Pooe, 2018). In line with all these studies, e-collaboration as a dynamic capability is expected to positively influence operational performance, customer and supplier satisfaction, growth, and profitability.

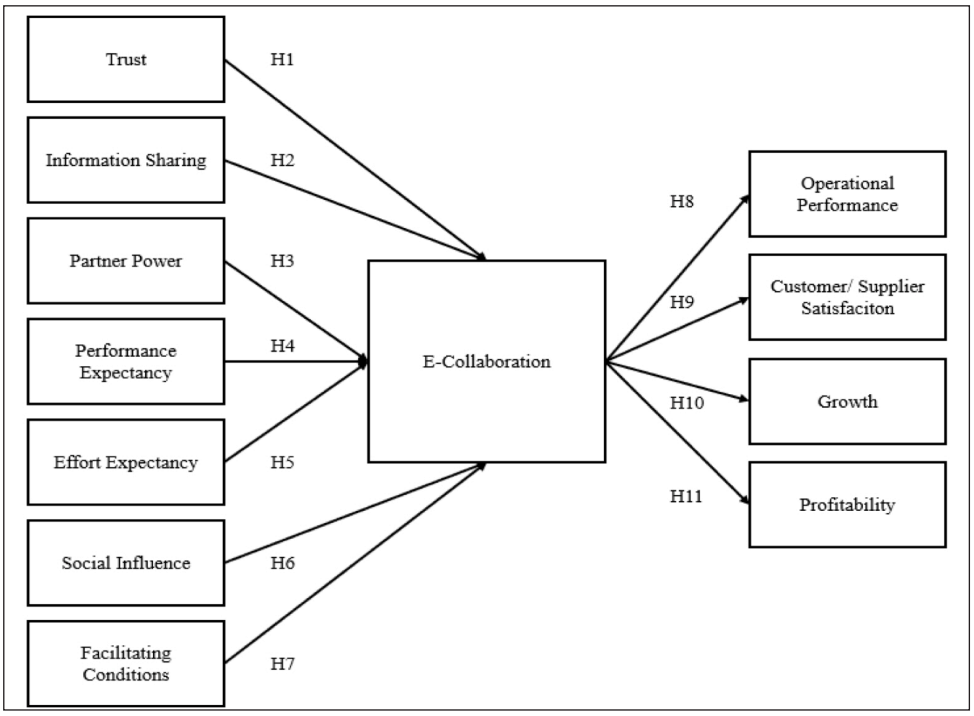

Figure 1: Research Model and Hypotheses

H8: E-collaboration positively impacts firms' operational performance.

H9: E-collaboration positively impacts firms' customer/ supplier satisfaction.

H10: E-collaboration positively impacts firms' growth.

H11: E-collaboration positively impacts firms' profitability.

RESEARCH METHODOLOGY

The research framework encompasses three key stages: literature review, data evaluation, and analysis. It began with a comprehensive literature review to identify research problems and hypotheses, followed by confirmatory factor analysis to assess the dataset's validity and reliability. SEM and path analysis were then used to interpret the findings. To better interpret survey results, interviews were conducted with founders of two logistics IT firms, serving as platform providers. Finally, the findings are interpreted in a literature-based/ comparative manner and managerial and theoretical implications are expressed.

Quantitative data were collected through a survey featuring sections on participant demographics, individual e-collaboration usage, and firm perspectives on e-collaboration with partners and competitors. The model and scales were adapted from Fawcett et al. (2011) and Chan et al. (2012), with scale explanations provided in Table 1.

The study focuses on Turkish businesses involved in international trade, assuming their engagement in global supply chains and proficiency in e-collaboration due to modern technology. A survey was emailed to companies listed in the "Top 1000 Exporters Survey" by the Türkiye Exporters Assembly (TİM, 2019) and those registered with the Exporters' Associations. Email addresses were sourced from membership lists, and the survey was distributed to approximately 30,000 corporate contacts, receiving 401 responses between January 3 and April 1, 2022. Participants were requested to include top executives and department managers to ensure that respondents had the necessary strategic management knowledge. The demographics of the participants are presented in Table 2.

In Table 2, 38.9% of participants are CEOs. 66.8% of companies operate in manufacturing, with 51.1% having 0-50 employees. Additionally, 57.4% of participants have over 21 years of sector experience, and 29.7% report annual revenues of 1 to 10 million TL.

To ensure the trustworthiness of the survey findings, face-to-face interviews were conducted with two experts to gain insights into the major results. These experts were purposefully sampled using the 'sampling for representativeness or comparability' approach (Maxwell, 2013; Teddlie and Yu, 2007), focusing on their relevance to

Table 1. Research Model Variables

		Number of Items	Measure	References
IOR	Trust	3	5-Point Likert	Chan et al. (2012)
	Information Sharing	2		
	Partner Power	3		
UTAUT	Performance Expectancy	2	5-Point Likert	Venkatesh et al. (2012)
	Effort Expectancy	2		
	Social Influence	3		
	Facilitating Conditions	4		
E-Collaboration	Evaluation	4	5-Point Likert	Chan et al. (2012)
	Adaptation	8		
	Routinization	5		
RBV outcomes	Operational Performance	6	5-Point Likert	Fawcett et al. (2011)
	Customer/Supplier Satisfaction	3		
	Growth	3		
	Profitability	1	3-Point Likert	

Table 2. Demographic Profile

Participant's Position	n	%	**Company's Industry Experience (Years)**	n	%
CIO	25	6.2	1 – 2	13	3.2
CEO	156	38.9	3 – 5	17	4.2
COO	40	10.0	6 – 10	48	12.0
CFO	46	11.5	11 – 20	93	23.2
Other	134	33.4	21 and above	230	57.4
Total	401	100	Total	401	100
Industry	n	%	**Company's Annual Revenue (Million TL)**	n	%
Manufacturing	268	66.8	Less than 1	26	6.5
Service	63	15.7	1 – 10	119	29.7
Retail/Wholesale Distribution	70	17.5	11 – 50	93	23.2
Total	401	100	51 – 100	38	9.5
			101 – 500	41	10.2
Company Size	n	%	501 – 1000	37	9.2
0 – 50	205	51.1	More than 1000	47	11.7
51 – 100	62	15.5	Total	401	100
101 – 300	56	14.0			
301 – 500	16	4.0			
501 – 1000	25	6.2			
1001 and above	37	9.2			
Total	401	100			

the study's purpose and their expertise (Neuman, 2020). The interview form crafted for this study comprised two sections: the first section contained questions derived from the survey, while the second section presented the statistical findings from the analysis. Each interview, conducted with participants' consent, lasted approximately 60 minutes. The objective was to elicit expert insights regarding the survey findings and to generate new perspectives aligned with the research objectives, thereby enhancing the study's validity and reliability (Creswell, 2015).

RESULTS

As the surveys were conducted online with mandatory questions, no data was missing. To ensure participant focus, responses with a standard deviation of zero were excluded, resulting in 401 usable responses for analysis. Skewness and kurtosis values were checked for each variable to assess normal distribution. The variable 'Facilitating Conditions 1' was removed from the dataset as it fell outside the acceptable range (-2 to +2) (Markoulis and Neofytou, 2016). Data were obtained from knowledgeable company executives, ensuring reliability and reducing common method bias (Narayanan et al., 2011). Harman's Single Factor Test revealed that a single factor explained only 26.344% of the cumulative variance, below the 50% threshold, indicating no common method bias in the research model (Podsakoff et al., 2003). Cook's Distance values were scrutinized to detect outliers, with all values below the recommended threshold of

Table 3: Results of Confirmatory Factor Analysis

Variable	Factor Load	R^2	CA	CR	AVE
Trust					
Implementing e-collaboration tools requires trusting your trading partners to share information such as designs, plans, and forecast demands.	0.66	0.44	0.73	0.75	0.51
Prior to adopting integrated supply chain management with e-collaboration tools, trust in our trading partners is crucial.	0.83	0.69			
We prioritize long-term relationships over short-term gains with our trading partners.	0.63	0.40			
Information Sharing					
We are ready to exchange critical supply chain information with our partners to implement e-collaboration tools.	0.82	0.67	0.82	0.84	0.72
Our partners are ready to exchange critical supply chain information with us to implement e-collaboration tools.	0.88	0.77			
Partner Power					
Supplier/client dependence on our firm enhances e-collaboration adoption.	0.73	0.53	0.66	0.69	0.52
Incentives from customers/suppliers, like cost sharing or financial rewards, promote e-collaboration tool implementation in the supply chain.	0.71	0.50			
Greater bargaining power allows companies to mandate e-collaboration tool adoption by their suppliers/customers.	*	*			
Performance Expectancy					
E-collaboration tools are beneficial for my work.	0.77	0.59	0.76	0.78	0.64
Employing e-collaboration tools enhances my productivity.	0.83	0.69			
Effort Expectancy					
Becoming proficient at using e-collaboration tools is easy for me.	0.91	0.83	0.85	0.86	0.76
I find e-collaboration tools easy to use.	0.83	0.69			
Social Influence					
My influencers believe I should use e-collaboration tools.	0.86	0.74	0.82	0.85	0.66
Those significant to me advocate for e-collaboration tool use.	0.89	0.79			
The senior management has supported e-collaboration tool adoption.	0.66	0.44			
Facilitating Conditions					
We have ample computers in our company.	*	*	0.79	0.80	0.59
Our company has both quantity and quality of IT specialists.	0.70	0.49			
We possess the technological resources for e-collaboration in our supply chain.	0.87	0.76			
We are knowledgeable about using e-collaboration tools.	0.72	0.52			
Operational Performance (To what extent do the following statements enhance collaboration with your supply chain partners?)					
Purchased item costs	0.89	0.79	0.93	0.94	0.74
Inventory performance (e.g., cost, levels, turns)	0.84	0.71			
Overall product and supply chain costs (productivity)	0.87	0.76			
Overall product quality	0.91	0.83			
New product development capability (e.g., cost, time, uniqueness)	0.86	0.74			
Transportation costs	0.77	0.59			
Customer/Supplier Satisfaction (To what extent do the following statements enhance cooperation with supply chain partners?)					
Responsiveness to customer/supplier demands and unexpected challenges	0.92	0.85	0.93	0.94	0.85
On-time service/performance delivery	0.92	0.85			
Total customer satisfaction	0.92	0.85			
Growth (How does your company's performance compare with your competitors for the following?)					
E-collaboration boosts our sales (Sales growth in the last 3 years)	0.96	0.92	0.95	0.96	0.90
E-collaboration enhances our market share (Market share growth in the last 3 years)	0.94	0.88			
E-collaboration improves our return on assets (ROA growth in the last 3 years)	0.94	0.88			
Profitability (Single Item)					
How does e-collaboration impact your company's profitability?					
E-Collaboration (Upper Dimension)			0.89	0.80	0.57
E-Collaboration Evaluation	***0.73***	***0.53***			

(Please rate the significance of these potential benefits of e-collaboration tools when your organization considered using them for your supply chain activities.)					
Cost reduction	0.92	0.85			
Market expansion for existing products/services	0.82	0.67			
Entry into new businesses or markets	0.76	0.58			
Enhanced coordination with customers and suppliers	0.81	0.66			
E-Collaboration Adaptation (Please rate the frequency of usage for the following e-collaboration tools in your supply chain)	***0.74***	***0.55***			
Direct procurement	0.75	0.56			
Replenishment	0.72	0.52			
Projected shortages	0.76	0.58			
Delivery and tracking	0.83	0.69			
Design	0.75	0.56			
Supply chain planning forecasting	0.78	0.61			
Capacity planning	0.76	0.58			
Business strategy	0.77	0.59			
E-Collaboration Routinization	***0.80***	***0.64***			
We have integrated e-collaboration tools with existing backend/legacy/supply chain systems.	0.78	0.61			
We have utilized e-collaboration tools to share information like forecasts, business strategies, and designs with our suppliers/customers.	0.85	0.72			
Real-time distribution information is gathered by integrating distribution systems with e-collaboration tools.	0.84	0.71			
Real-time inventory information is collected by integrating inventory systems with e-collaboration tools.	0.80	0.64			
Ordering and purchasing are entirely conducted with our customers and suppliers via e-collaboration tools.	0.85	0.72			

* Excluded from analysis due to pre-analysis stage conditions not being met.

1 (Aguinis et al., 2013), indicating no outliers present. Variance inflation factor (VIF) values were checked for multicollinearity among independent variables, all of which were below the threshold of 5 (Kline, 2005; Hair et al., 2010), suggesting no multicollinearity in the study.

Confirmatory Factor Analysis (CFA)

Before proceeding to SEM, CFA was conducted using SPSS Amos 25 to evaluate each item's contribution to the scales and assess how effectively each scale measured its intended concept. Table 3 demonstrates that composite reliability (CR) values exceed the threshold of 0.7 (Hair et al., 2010), ensuring reliability. Moreover, standardized factor loadings and average variance extracted (AVE) values surpass the minimum threshold of 0.5, affirming scale validity.

Validity is demonstrated through convergent and discriminant validity, assessed by structural validity measurement. Discriminant validity is tested using the following criteria: (1) maximum shared variance (MSV)<AVE, (2) average shared variance (ASV)<AVE, and (3) the square root of AVE>correlation between factors (Hair et al., 2010). Findings for discriminant validity based on Table 3 are as follows:

1. For Partner Power, MSV>AVE, requiring its exclusion.

2. ASV<AVE, meeting the condition.

3. The square root of AVE for Partner Power<correlation with Information Sharing, necessitating its exclusion.

Convergent validity is assessed by ensuring CR>AVE>0.5 (Hair et al., 2010), as shown in Table 4 for all variables.

Assessment of Goodness of Fit in CFA

Fit indices, as outlined by McDonald and Ho (2002), evaluate model alignment with reality. Table 5 demonstrates that the specified fit indices fall within both good and acceptable ranges.

Structural Equation Modeling and Path Analysis

SEM was conducted using Amos 25 to assess the alignment between the proposed model and research hypotheses. The primary objectives of employing SEM for data analysis include its capacity to estimate and test hypothesized relationships between observed and latent variables (Rigdon, 1996), its ability to explain variances in the proposed model with minimal error (Kline, 2005), its capability to conduct multiple analyses concurrently by examining all relationships within a complex model

Table 4: Validity and Reliability Assessment

	CR	AVE	MSV	ASV	1	2	3	4	5	6	7	8	9	10	11
Trust	0.75	0.51	0.44	0.16	**0.71**										
Information Sharing	0.84	0.72	0.63	0.24	0.35	**0.85**									
Partner Power	0.69	0.52	0.63	0.37	0.67	0.79	**0.72**								
Performance Expectancy	0.78	0.64	0.58	0.35	0.56	0.49	0.70	**0.80**							
Effort Expectancy	0.86	0.76	0.52	0.22	0.45	0.42	0.58	0.72	**0.87**						
Social Influence	0.85	0.66	0.58	0.31	0.43	0.54	0.72	0.76	0.52	**0.81**					
Facilitating Conditions	0.80	0.59	0.42	0.15	0.14*	0.27	0.33	0.35	0.34	0.38	**0.78**				
E-Collaboration	0.80	0.57	0.50	0.36	0.30	0.55	0.63	0.59	0.48	0.62	0.65	**0.78**			
Operational Performance	0.94	0.74	0.74	0.31	0.31	0.42	0.57	0.58	0.37	0.48	0.46	0.70	**0.86**		
Customer/Supplier Satisfaction	0.94	0.85	0.75	0.31	0.36	0.42	0.58	0.57	0.43	0.47	0.43	0.66	0.86	**0.92**	
Growth	0.96	0.90	0.47	0.25	0.23	0.48	0.68	0.52	0.31	0.49	0.39	0.69	0.62	0.60	**0.95**

*($p<0.05$), others ($p<0.01$), The AVE square root values are in **bold.**

Table 5: Model Fit Results

	Fit Index	Model Fit Results	Good Fit	Acceptable Fit
Absolute fit index	X^2/sd	1.597	X^2/sd≤3	X^2/sd≤5
	GFI	0.88*	0.95≤GFI	0.90≤GFI
	AGFI	0.85	0.90≤AGFI	0.80≤AGFI
	RMSEA	0.039	RMSEA≤0.05	RMSEA≤0.10
Comperative fit index	NFI	0.90	0.95≤NFI	0.90≤NFI
	CFI	0.96	0.95≤CFI	0.90≤CFI

* Given the model's complexity and sample size, a GFI of 0.8 or above is deemed acceptable (Doll et al., 1994; Baumgartner and Homburg, 1996; Schermelleh-Engel et al., 2003).

simultaneously, and its provision of opportunities for iteratively refining the model through repeated testing (Hoyle, 1995; Tabachnick and Fidell, 2012). Figure 2 presents results, with key findings discussed in the following sections.

Table 6 displays goodness-of-fit values for SEM path analysis, used to test research hypotheses, indicating an acceptable model fit.

Table 7 presents the acceptance and rejection statuses of proposed hypotheses. While hypotheses (H1, H2) regarding positive and significant relationships between trust and information sharing dimensions under the inter-organizational relationships approach and e-collaboration were not supported, hypothesis (H3) regarding the significant and positive relationship of partnership power on e-collaboration was supported.

Within the UTAUT framework, positive relationships between performance expectancy and facilitating conditions with e-collaboration were supported (H4, H7), while no significant relationship was found between effort expectancy and social influence with e-collaboration (H5, H6). E-collaboration, assessed as a dynamic capability, exhibited significant and positive relationships with operational performance, customer/supplier satisfaction, growth, and profitability (H8, H9, H10, H11).

Discussion of Survey Findings and Insights from Expert Interviews in E-Collaboration Dynamics

This study explores e-collaboration as a dynamic capability in supply chains within the contexts of inter-organizational relationships and the UTAUT. Findings from a survey with international trade firms in Turkey and expert interviews are summarized below:

1. Model testing reveals that, contrary to the proposed hypothesis, interfirm trust has a significant, albeit moderately negative, significant effect on e-collaboration

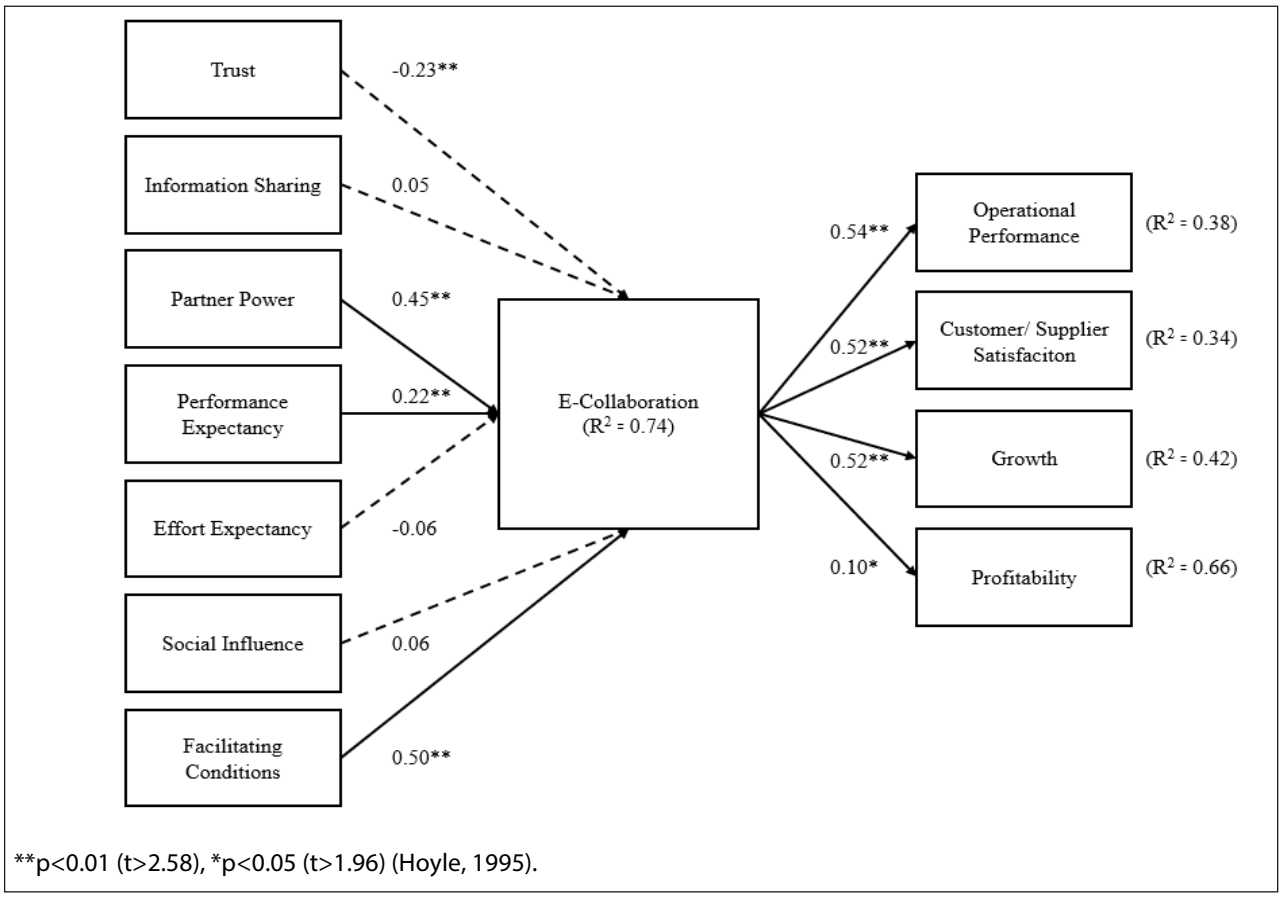

Figure 2: Standardized Estimation Results

Table 6: Model Fit Results

	Fit Index	Model Fit Results	Good Fit	Acceptable Fit
Absolute fit index	X^2/sd	4.45	X^2/sd≤3	X^2/sd≤5
	GFI	0.98	0.95≤GFI	0.90≤GFI
	AGFI	0.87	0.90≤AGFI	0.80≤AGFI
	RMSEA	0.093	RMSEA≤0.05	RMSEA≤0.10
Comperative fit index	NFI	0.99	0.95≤NFI	0.90≤NFI
	CFI	0.99	0.95≤CFI	0.90≤CFI

(β=-0.23; t=-4.82). Previous literature underscores trust's pivotal role in inter-organizational relationships, emphasizing its positive impact on the collaboration process (Chong and Ooi, 2008; Chan et al., 2012; Chen et al., 2014; Tsanos and Zografos, 2016; Mora-Monge et al., 2019). Unlike conventional literature findings, this study diverges on trust, necessitating a thorough examination and interpretation of trust-related research and findings.

Villena et al. (2016) highlighted a downside to trust in inter-organizational relationships, observing a 'reverse U' shaped relationship between trust and performance. Their findings suggest that when trust among trading partners reaches a certain level, potential benefits are balanced, leading to subsequent performance declines. Connelly et al. (2018) suggested that trust based on competencies motivates organizations to engage in collaboration, while trust grounded in subjective factors like honesty raises concerns about collaboration. In another study, it was emphasized that while trust is important, it is not sufficient on its own; there is a need for supply chain members to evaluate and monitor each other transparently (Zeiringer and Thalmann, 2021). Wang et al. (2019) also noted that in multi-tier supply chains, where transparency is crucial, the level of trust among members is generally low. Another study suggested

Table 7: Summary of Hypotheses Test Results

Hypothesis	Path Coefficient	t value	Assumption Results
H1: Trust→E-Collaboration	-0.23	-4.82**	**Not Supported**
H2: Information Sharing→E-Collaboration	0.05	0.81	**Not Supported**
H3: Partner Power→E-Collaboration	0.45	4.22**	Supported
H4: Performance Expectancy→E-Collaboration	0.22	3.56**	Supported
H5: Effort Expectancy→E-Collaboration	-0.06	-1.53	**Not Supported**
H6: Social Influence→E-Collaboration	0.06	1.14	**Not Supported**
H7: Facilitating Conditions→E-Collaboration	0.50	17.50**	Supported
H8: E-Collaboration→Operational Performance	0.54	14.88**	Supported
H9: E-Collaboration→Customer/Supplier Satisfaction	0.52	13.28**	Supported
H10: E-Collaboration→Growth	0.52	8.23**	Supported
H11: E-Collaboration→Profitability	0.10	2.35*	Supported

**p<0.01 (t>2.58), *p<0.05 (t>1.96)

that insufficient trust can hinder the advancement of sustainability in the supply chain, highlighting the need for careful management of trust to prevent excessive dependence, which may result in reduced innovation and responsiveness (Asif et al., 2023). Moreover, Kim and Lee (2024) indicated that placing too much focus on trust could lead to a lack of proper attention to risk assessment and mitigation measures, both of which are crucial for ensuring the resilience of supply chains.

The highly dynamic nature of collaboration, coupled with various influences such as cultural diversity and competition, further complicates the already complex concept of trust, making its impact on supply chain management more significant (Huang et al., 2020). In the context of inter-organizational relationships, no significant relationship was found regarding the role of trust in influencing the adoption of e-collaboration processes in the supply chains of small and medium-sized enterprises (SMEs) in Malaysia (Chong et al., 2009).

The interplay between trust and distrust is a debated topic in the literature. Connelly et al. (2012) examined the balance between trust and distrust in inter-organizational relationships, suggesting that reducing distrust may offer greater benefits than increasing mutual trust. Han et al. (2021) argued that assuming constant high levels of trust overlooks associated risks. Distrust, on the other hand, pertains to negative situations that trust can foster in inter-organizational relationships (Skinner et al., 2014). Both Liu et al. (2009) and Connelly et al. (2012) proposed that distrust may prompt protective activities among supply chain partners, underscoring the importance of legal contracts emphasizing control and legal protection. Hence, rather than evaluating trust and distrust separately, they should be viewed as complementary elements in supply chain management, necessitating careful management (Lumineau, 2017; Han et al., 2021).

The connection between trust and collaboration is dynamic. Han et al. (2021) suggested that although trust typically grows over the course of a relationship, it doesn't always guarantee a healthy inter-organizational relationship (IOR), implying that trust must be continually cultivated and managed. This aligns with the findings of Biswas and Akroyd (2022), which highlight that sustained collaborative efforts require investments in relationship-specific factors, ultimately leading to higher levels of trust.

In one-on-one interviews, participants shared findings and insights on the issue at hand. A recurring theme emerged, emphasizing the role of technology platforms as trust providers for firms engaging in collaboration. The following participant statements illustrate this:

"Our platform serves as an intermediary, facilitating business between two firms. Essentially, we become the trusted service provider. With our infrastructure, including software and systems ensuring cybersecurity, we instill confidence. For instance, as we handle cash flow, upon transaction completion, funds are promptly transferred to the parties' accounts. This, in itself, fosters trust." (Participant 2)

"These platforms enhance trust and reliability within the system. The data we provide isn't obscure; it could be obtained from the shipowner, albeit not as swiftly, systematically, or reliably. Moreover, we add value to it..." (Participant 1)

There is minimal emphasis on the importance of digital technologies in building inter-organizational trust (Qian and Papadonikolaki, 2021). The findings of this research reveal a significant negative relationship between trust and e-collaboration. It is observed that when organizations trust each other, they may not feel the need for e-collaboration; however, when trust diminishes, the presence of an electronic platform facilitating collaboration and building trust could steer them towards this process. A similar approach was also articulated in the studies by Panahifar et al. (2018), Guo (2023), and Mohaved et al. (2023). Accordingly, when there is a lack of trust between parties, it is suggested that this void be filled through a secure information sharing system.

Based on findings and the literature, one possible explanation for the negative correlation is that high levels of trust might reduce the perceived need for formalized electronic systems to monitor and facilitate collaboration. When firms trust each other deeply, they may rely more on informal agreements and personal relationships, thus diminishing the perceived necessity for structured e-collaboration platforms. This phenomenon can be particularly pronounced in cultures or industries where personal relationships and face-to-face interactions are highly valued. Moreover, the negative impact of trust on e-collaboration could be attributed to the potential complacency that excessive trust might induce. High trust levels may lead to a reduction in vigilance and a lower propensity to engage in proactive information sharing and monitoring, which are critical components of effective e-collaboration. This aligns with the findings of Villena et al. (2016) regarding the 'reverse U' shaped relationship, where too much trust can lead to complacency and a subsequent decline in performance.

Additionally, the role of digital technologies as trust facilitators, as highlighted by interview participants, underscores the evolving nature of trust in the digital age. Technology platforms can provide the necessary transparency, security, and efficiency that might be lacking in traditional trust-based relationships. These platforms can serve as neutral intermediaries, ensuring that transactions and collaborations are conducted smoothly and securely, thereby compensating for any lack of inter-organizational trust.

2. Additionally, model test results indicate no significant effect of information sharing on e-collaboration (β=0.05; t=0.81). It remains unclear whether firms are willing to share crucial information with supply chain partners to utilize e-collaboration tools, or vice versa. This finding diverges from existing literature.

Chong et al. (2009) identified information sharing as a critical factor influencing the adoption of e-collaboration processes in supply chains of small and medium-sized enterprises in Malaysia. Conversely, Hoove-Sibanda and Poove (2018) explored the relationships among e-collaboration, information sharing, and supply chain performance. They discovered that e-collaboration within the supply chain significantly influences strategic information sharing. However, they observed that while strategic information sharing has notable effects on supply chain capability and performance, these effects are relatively weak. The authors suggested that while strategic information sharing may not be a potent determinant on its own, its integration with factors like competitive advantage and supply chain learning enhances its impact on capability and performance.

Consistent with this study's findings, Chan et al. (2012), in their investigation into factors influencing the adoption of e-collaboration in small and medium-sized enterprises, also found no significant impact regarding the significance of information sharing. Zeiringer and Thalmann (2021) highlighted that excessive and unnecessary information sharing among parties can entail potential risks. Thus, they stress the importance of sharing only essential information, even with trusted partners. Moreover, it is observed that in many supply chains, parties are reluctant to disclose their strategic information (Chu and Lee, 2006; Prajogo and Olhager, 2012), leading to unsuccessful attempts at establishing numerous collaborations due to insufficient information sharing (Skippari et al., 2017; Yuen and Thai, 2017; Panahifar et al., 2018; Singh et al., 2018). Recent studies (Susanto et al., 2023; Zaman et al., 2023) have highlighted the complexities that complicate the traditional view of information sharing as wholly beneficial. While information sharing is essential for successful collaboration, these studies indicate that it can lead to misunderstandings, conflicts, and inefficiencies if not managed effectively.

Studies (Panteli and Sockalingam, 2005; Cai et al., 2013; Huong Tran et al., 2016; Jen et al., 2020) have suggested that trust serves as a foundation for information sharing, implying that when trust between parties strengthens, information sharing tends to increase. Additionally, the connection between trust and information sharing

is commonly depicted as reciprocal, with effective information sharing contributing to the development of trust (Gattiker et al., 2007; Ou et al., 2014; Lee and Kim, 2023). Hence, a strong association between trust and information sharing is apparent. It is speculated that the noteworthy yet negative relationship between trust and e-collaboration, as identified in this study, might have impacted the absence of a significant relationship between information sharing and e-collaboration.

During the expert interviews, it became evident that reservations about information sharing in collaborations often stem from a lack of understanding on this matter. It is believed that raising awareness about the functioning of online platforms in supply chains and providing information could alleviate concerns regarding information sharing.

According to one interviewee: "Whether to share information or not doesn't actually change much for the companies. The same information was being shared through traditional methods, and our platform also requests and shares the same information. No extra confidential information is being obtained, so there is no reason for them to be hesitant about sharing their data." (Participant 2)

Companies exhibit serious concerns, particularly regarding the sharing of strategic information with their supply chain partners. This apprehension about information security in traditional business practices can be addressed with the assistance of electronic platforms acting as intermediaries. Sharing economy platforms offer features such as information security, sharing only necessary information, transparency, and traceability of shared information.

3. The hypothesis results examining individuals' attitudes toward e-collaboration within the UTAUT framework yield significant insights. As per the model test results, users' performance expectations exhibit a significant and moderately positive effect on e-collaboration (β=0.22; t=3.56), while the facilitating conditions provided to users demonstrate a significant and highly positive effect on e-collaboration (β = 0.50; t = 17.50). These findings align with existing literature (Oliveira et al., 2014; Chauhan and Jaiswal, 2016; Cimperman et al., 2016; Sabi et al., 2016; Sumak and Sorgo, 2016; Hoque and Sorwar, 2017; Cao and Niu, 2019; Chao, 2019; Queiroz and Wamba, 2019; Avcı, 2022; Jain et al, 2022; Kapnissis et al., 2022; Çiftçi et al., 2023; Zhang et al., 2023). Users perceive e-collaboration tools as advantageous for their work, anticipating enhanced productivity and job performance. Moreover, they believe their organizations possess sufficient technological resources and IT personnel, along with access to requisite resources and information, to effectively utilize e-collaboration tools within their supply chain networks.

The study findings reveal that users' effort expectancy (β = -0.06; t = 1.14) and the social influence they experience (β = 0.06; t = 1.14) do not significantly impact e-collaboration. Previous research on technology adoption has highlighted the significant influence of effort expectancy (Chauhan and Jaiswal, 2016; Cimperman et al., 2016; Hoque and Sorwar, 2017; Cao and Niu, 2019; Chao, 2019) and social influence (Oliveira et al., 2014; Chauhan and Jaiswal, 2016; Cimperman et al., 2016; Sumak and Sorgo, 2016) on usage intentions. However, this study diverges from these findings. Participants did not perceive a significant correlation with the ease of using e-collaboration tools. This could be attributed to their familiarity with existing IT applications and the advanced technological landscape. Furthermore, participants did not feel compelled by colleagues, friends, or senior management to adopt e-collaboration tools.

From a corporate standpoint, raising awareness about e-collaboration is crucial. Educating both employees and organizations about the benefits of e-collaboration tools, providing necessary training, and encouraging internal and supply chain-wide discussions can facilitate their adoption.

4. The model test results indicate that e-collaboration significantly and positively impacts firms' operational performance, customer/supplier satisfaction, and growth (β=0.54, 0.52, 0.52; t=14.88, 13.28, 8.23, respectively), and has a significant but modest positive effect on profitability (β=0.10; t=2.35). These findings align with previous research in the literature (Chang, 2014; Jean et al., 2014; Hoove-Sibanda and Poove, 2018; Panahifar et al., 2018; Yang et al., 2019; Baah et al., 2022; Sheyadi and Shaukat, 2023; Al-Khateeb, 2024).

E-collaboration, recognized as a sophisticated IT innovation, has become pivotal in fostering robust inter-organizational relationships (Jean et al., 2014). Within supply chains, collaborative endeavors yield significant enhancements in meeting member needs, building loyalty and trust, and enhancing overall performance (Yang et al., 2019; Baah et al., 2022).

Viewed through a RBV and dynamic capabilities framework, e-collaboration emerges as a pivotal capability, offering firms and their supply chains a

competitive edge. The outcomes, including enhanced operational performance, satisfaction, growth, and profitability, underscore its role as a valuable and unique strategic resource, empowering firms to navigate dynamic markets effectively.

In expert interviews, participants discussed the potential outcomes of e-collaboration adoption for firms and supply chains, especially in Turkey. They emphasized that the benefits of these evolving processes may become more evident as they develop over time.

"The benefits derived from e-collaboration hinge on its effective utilization and the organization's capacity to leverage it. Overall, I anticipate that e-collaboration will positively impact various parameters. Our ongoing activities affirm this belief." (Participant 1)

Electronic platforms in supply chains are increasingly utilizing concrete data to assess the benefits they offer to customers. Participants highlighted that their customers are indeed benefiting from their engagement in these processes, as evidenced by the data they have gathered. This realization prompts further investment in such applications.

"Do our customers reuse our systems? Have they repurchased our products? How efficiently do they utilize them? Have they continued to pursue these collaborations? When I collect this data from our system, I can conclude that firms providing positive answers to these questions benefit from these collaborations. Our results further confirm this trend: we are establishing long-term collaborations with existing customers and attracting new ones. Therefore, I can assert that these processes are beneficial for companies, with these benefits increasingly apparent." (Participant 2)

Theoretical Contributions

This study offers notable theoretical contributions. It delves into the factors influencing e-collaboration by examining both inter-organizational relationships and individual user perspectives. This approach not only broadens the scope of understanding by integrating different levels of analysis but also addresses a significant gap in the literature where the interplay between organizational and individual factors in e-collaboration has been underexplored (Chan et al., 2012).

The study challenges the established assumption in the literature that trust unequivocally enhances e-collaboration in supply chains. While prior studies (e.g., Chong and Ooi, 2008; Chan et al., 2012; Chen et al., 2014) emphasized the positive role of trust, our findings suggest a nuanced relationship. The observed moderately negative effect of trust on e-collaboration ($\beta = -0.23$) indicates that when trust levels are high, firms may not feel compelled to adopt formal e-collaboration tools. This finding contributes to a growing body of literature (Villena et al., 2016; Connelly et al., 2018) that questions the simplistic positive portrayal of trust and suggests that excessive trust may lead to complacency, reducing the perceived need for structured electronic systems. This insight encourages scholars to explore the dual role of trust and distrust as complementary, rather than mutually exclusive, elements in supply chain management (Lumineau, 2017; Han et al., 2021).

The study provides a theoretical extension by introducing digital platforms as potential trust facilitators within supply chain networks. This perspective aligns with recent discussions in the literature (Qian and Papadonikolaki, 2021; Carlini et al., 2023; Guo, 2023; Mohaved et al., 2023; Um, 2023; Ferro-Soto et al., 2024) but advances it by empirically demonstrating that in contexts where trust diminishes, digital platforms can act as intermediaries that foster confidence and encourage e-collaboration. This underscores a shift in the understanding of trust, transitioning from a purely relational construct to one that can be mediated by technology. Consequently, it enriches the literature on technology adoption and trust by indicating that digital technologies can offer the transparency, security, and efficiency that are often absent in traditional trust-based relationships.

This study suggests that the relationship between information sharing, and e-collaboration may be contingent on other factors, such as the nature of the information being shared and the existing levels of trust. It also aligns with studies that indicate excessive information sharing may entail risks (Zeiringer and Thalmann, 2021). This finding broadens the theoretical understanding by suggesting that firms may prioritize strategic and selective information sharing over sheer volume, thereby refining the conceptualization of information sharing in e-collaboration literature.

The study's findings extend the UTAUT model by providing insights into the specific factors influencing e-collaboration adoption. While performance expectancy ($\beta = 0.22$) and facilitating conditions ($\beta = 0.50$) were found to significantly affect e-collaboration, effort expectancy and social influence did not show a significant impact. This departure from previous research (Oliveira et al., 2014; Chauhan and Jaiswal, 2016) indicates that, in

international trade firms familiar with IT applications, ease of use and social pressures may be less significant than previously assumed, suggesting that the UTAUT model may require contextual adaptation for specific technological innovations like e-collaboration in supply chain management.

By framing e-collaboration as a dynamic capability within the RBV and dynamic capabilities frameworks, the study reinforces the concept of e-collaboration as a strategic resource that provides competitive advantage. The positive effects of e-collaboration on operational performance, customer/supplier satisfaction, growth, and profitability underscore its value as a unique capability that allows firms to respond to dynamic market conditions effectively. This perspective contributes to the strategic management literature by emphasizing e-collaboration's role in enhancing supply chain agility and adaptability, thereby providing a robust foundation for future research on dynamic capabilities in supply chains.

By employing SEM, the study elucidates the correlations and covariances among multiple variables, enhancing the model's explanatory power (Kline, 2005). This methodological contribution is crucial as it not only provides robust statistical validation of the proposed relationships but also offers a nuanced understanding of the complex interactions within the e-collaboration framework. The findings suggest specific avenues for refining the model, potentially leading to more accurate predictions and deeper insights into the mechanisms of e-collaboration.

Finally, to ensure the validity of the quantitatively collected data in practical scenarios, expert evaluations were conducted via one-on-one interviews. This mixed-method approach enhances the study's coherence and comprehensiveness by triangulating quantitative findings with qualitative insights. The expert evaluations provide practical validation and contextual depth, ensuring that the theoretical contributions are grounded in real-world applicability and enhancing the overall robustness and reliability of the study's conclusions (Bryman, 2006; Creswell, 2015).

Managerial Implications

In the realm of inter-organizational relationships, practitioners should capitalize on opportunities to cultivate trust throughout collaborative endeavors. To harness the benefits of e-collaboration while managing the complexities of trust, organizations should focus on developing robust digital infrastructures that can complement and enhance inter-organizational trust (Wang et al., 2023). Robust trust facilitates information sharing behaviors, enabling the exploitation of novel insights from external sources to seize emerging opportunities. Furthermore, training and development programs aimed at fostering digital literacy and trust-building skills among employees can help bridge the gap between traditional trust mechanisms and modern digital collaboration tools. These programs should go beyond technical skills and prioritize interpersonal communication, empathy, and conflict resolution within digital environments (Dennis et al., 2013).

By integrating these approaches, organizations can create a balanced ecosystem where trust and e-collaboration coexist and reinforce each other, ultimately leading to improved supply chain performance and innovation. Additionally, organizations wielding significant partnership power within their supply chains and industries are positioned to influence the adoption of innovative practices among peer firms, including competitors (Fares and Lloret, 2023). Strategically leveraging this influence could involve establishing industry-wide forums or working groups to encourage collaborative standards, joint investments in technology, and the sharing of best practices, all of which can contribute to creating collective value.

Another strategic directive for practitioners pertains to individual users, particularly employees directly engaging with e-collaboration tools. These users prioritize leveraging technological capabilities to enhance their job performance, anticipating that such enhancements will yield benefits at both individual and organizational levels (Zhang and Tur, 2023). Managers should thus acknowledge the potential for performance improvements through investments in technological advancements, empowering employees to drive innovation and contribute to overall firm success (Turyadi et al., 2023). This can be accomplished by developing incentive structures that recognize and reward both individual and team-driven innovative efforts, thereby fostering a culture that prioritizes continuous improvement and learning.

Furthermore, leadership is crucial in steering and supporting a trust-focused e-collaboration strategy (Li et al., 2024). Management should actively foster a digital mindset, not only by setting strategic direction and policies but also by leading by example—showing openness, transparency, and trust in digital engagements. This can be further strengthened by forming cross-

functional teams that combine diverse expertise and perspectives, thereby enhancing problem-solving abilities and fostering innovative solutions through collaboration.

Broadening e-collaboration efforts to encompass not only internal teams but also external stakeholders—such as suppliers, customers, and even competitors in co-opetition settings—can significantly enhance the benefits (Ardakani et al., 2023). By cultivating a more extensive network of digital collaboration, organizations can improve their agility and resilience in fast-evolving environments, thereby strengthening their competitive advantage.

In addition, in line with the findings on trust and information sharing, businesses can make more use of sharing economy platforms in their supply chains. The sharing economy causes power transformations in industrial economies, making the service sector the main driver of economic growth and creating opportunities for sustainable development for industries (Pu and Pathranarakul, 2019). With the sharing economy, access to information and sharing of detailed information has become easier and trust between users has increased (Curtis and Lehner, 2019; Rossmannek and Chen, 2023).

CONCLUSION

This study advances the theoretical understanding of e-collaboration in supply chains by examining its complex relationship with trust within the context of inter-organizational relationships and the UTAUT framework, while also exploring how trust and knowledge sharing can be strengthened through sharing economy platforms, particularly in low-trust environments. Findings from a survey with international trade firms in Türkiye and expert interviews reveal that while trust is a crucial factor in supply chain management, its impact on e-collaboration is nuanced and multifaceted.

The findings reveal that trust can have a complex, and at times counterintuitive, influence on e-collaboration processes. Notably, the discovery of a negative relationship between interfirm trust and e-collaboration challenges established notions within the literature, suggesting that excessive trust may diminish the perceived necessity for structured collaborative frameworks.

The investigation also sheds light on the reciprocal relationship between trust and information sharing, indicating that while these elements are traditionally viewed as mutually reinforcing, their interaction can be influenced by contextual factors, including organizational culture and the perceived risks associated with information exchange.

Moreover, the role of digital platforms as facilitators of trust highlights the evolving dynamics in inter-organizational relationships, emphasizing the importance of transparency and security in fostering collaboration. The study's emphasis on user performance expectations and facilitating conditions further underscores the need for organizations to cultivate an environment conducive to e-collaboration adoption. Ultimately, e-collaboration can enhance operational performance, customer/supplier satisfaction, growth, and profitability, demonstrating its significant impact on supply chain management.

The study confronts several limitations stemming from both methodological approaches and study specifics. One constraint arises from the dearth of literature exploring the implementation of the sharing economy concept within business and supply chain contexts. Additionally, accessing all foreign trade businesses operating in Turkey, the study's sample, necessitates substantial time and financial resources. While efforts were made to uphold validity and reliability by adhering to scientific principles and securing a sufficient sample size, restricting the sample to Turkish firms precludes comparative analysis with others.

The study hypothesized that trust and information sharing, key drivers of collaboration, would positively impact e-collaboration. However, these hypotheses were not supported. While the findings section sheds light on this outcome, future research is warranted to more thoroughly examine the influence of trust and information sharing on e-collaboration. It would be particularly valuable to explore the specific conditions under which trust, and information sharing might become more significant, such as in varying organizational cultures, sizes, or sectors. This could help to identify contextual factors that could either strengthen or weaken these relationships. Moreover, stakeholder theory can be used to analyze how sharing economy platforms respond to stakeholder expectations and build organizational capabilities to increase trust and encourage knowledge sharing.

Additionally, investigating the moderating effect of technology use on these relationships could yield novel insights, suggesting a valuable avenue for further exploration. Future studies could employ longitudinal research designs to capture how the dynamics of trust and information sharing evolve over time with

continued technology use. Mixed-method approaches, combining qualitative and quantitative data, could also be advantageous in uncovering deeper insights into the mechanisms underlying these relationships.

Moreover, further research could examine other potential moderating or mediating variables, such as organizational readiness for digital transformation, employee digital literacy, and the role of leadership in fostering a collaborative e-environment. Understanding these variables' interplay may reveal new pathways for enhancing e-collaboration.

Note: This article is based on the first author's PhD thesis.

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