The Role of Supplier Trust in Enabling the Twin Transition

Alinda Kokkinou, Jan van Elderen
Breda University of Applied Sciences, Breda, the Netherlands
kokkinou.a@buas.nl, elderen2.j@buas.nl

The twin transition, the concurrent pursuit of digital and green transformation, requires organizations to develop specific dynamic capabilities. The present study examines how a Dutch textile company successfully transitioned from a linear to a circular business model. It identifies supplier trust as a critical yet underexplored enabler. Drawing on Dynamic Capability Theory and a longitudinal single-case study spanning 2021 to 2026, the study finds that trust-based supplier relationships underpin two key organizational dynamic capabilities: data analytic capability and sustainable supplier management capability. Supplier trust facilitates the cross-organizational data flows needed for evidence-based sustainability decision-making, while simultaneously enabling the collaborative R&D investments required for circular supply chain development. The findings challenge the assumption that the twin transition is primarily a technological challenge. Instead, the relational capabilities are foundational preconditions for effective digitalization.

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1 Introduction

Climate change is forcing businesses and governments to take urgent action in order to mitigate future natural disasters (Ghadge et al., 2020). The manufacturing and production sectors are estimated to account for one-fifth of the world's carbon emissions (World Economic Forum, 2022). The textile industry, in particular, was estimated to be the fifth highest user of raw materials and greenhouse gas emissions in 2020, in addition to causing the third highest pressure on water and land use (European Environment Agency, 2024). In Europe, this has prompted the European Commission to formulate the European Green Deal, a comprehensive strategy to achieve climate neutrality by 2050. Recognizing digitalization as an enabler of sustainability, the European Union also prioritized digital transformation as part of the European Green Deal. The concurrent pursuit of green and digital transformations has been coined the "twin transition." This concept refers to the "*intertwined and simultaneous green and digital transition to offset companies' carbon footprint*" (Rehman et al., 2023, p. 1) and centers on the notion that the green and digital transformation are synergistic (Accenture Research, 2021). While extensive research has been conducted on the topic from a policy perspective, relatively few studies have examined it from a business perspective, on an organizational level (Tabares et al., 2025). Furthermore, research on digital transformation and research on sustainable and circular transformation have often been conducted from within discipline silos (Christmann et al., 2024). So, despite digitalization being widely acknowledged as a potential enabler of sustainability, the complex relationship between the two remains only marginally understood (Patrucco et al., 2025).

For organizations striving to develop their sustainable and circular business models, a better understanding of how the twin transition unfolds at the organizational level is therefore needed (Christmann et al., 2024). This includes better insight into the organizational capabilities needed for such a transformation (Belhadi et al., 2022). Central amongst these capabilities are digitalization capabilities, which enable the data exchange and transparency required to support circular business models (Kokkinou & Mitas, 2026). However, such capabilities are contingent on suppliers' willingness to share data and knowledge across organizational boundaries. This suggests that buyer-supplier trust is a critical yet underexplored antecedent (Gualandris & Kalchschmidt, 2016), leading to two research questions: (RQ1) *how does trust enable the development of digitalization capabilities in support of a circular business model*

transition? and (RQ2) *how does trust enable the development of sustainable supplier management capabilities in the context of the transition to a circular business model?* The purpose of the present study was therefore to explore the capabilities needed to successfully transition to a circular business model. Given the complex and emerging nature of twin transition in combination with a relative lack of empirical studies on the topic, a longitudinal single-case study design was used to examine how a focal organization successfully transitioned from a linear to a circular business model, identifying supplier trust as an enabler of both digitalization and sustainable supplier management capabilities. The study thereby contributes to the body of knowledge on technology-driven sustainability transitions, advancing our understanding of the mechanisms by which digitalization shapes sustainability- and circularity-oriented practices (Patrucco et al., 2025).

2 Review of the Literature

The Dynamic Capability Theory (DCT), a powerful theory explaining how organizations develop and maintain their competitive advantage in changing market and environmental conditions (Teece et al., 1997) forms the theoretical background for this study. Dynamic capabilities are combinations of assets, resources, and organization-specific processes that allow organizations to sense their environment, seize opportunities, and reconfigure accordingly (Teece, 2007). According to DCT, organizations develop dynamic capabilities to maintain their competitive advantage as market conditions change or as disruptions occur.

While sustainability and circularity are distinct, sustainability practices are essential for circularity (Romagnoli et al., 2023). The adoption of sustainable practices has been shown to contribute to circular supply chain functionality and thereby improve business performance. Gualandris & Kalchschmidt (2016) distinguish between sustainable process management and sustainable supplier management. Sustainable process management practices primarily focus on reducing waste, improving health and safety within the organization, and developing environmentally friendly products. They are often developed over time, through trial and error, by combining assets and resources in a unique way. Sustainable supplier management practices typically span organizational boundaries and include environmental and social assessments of suppliers and, more generally, collaboration within the supply chain.

Gualandris & Kalchschmidt (2016) find sustainable process management to be an antecedent of sustainable supplier management.

Even though circularity is supported by sustainability practices, the two are distinct. Whereas sustainability practices principally focus on reducing waste across the supply chain, the circularity paradigm is more comprehensive, extending to preserving (Dwivedi & Paul, 2022) and even revitalizing materials and products (Bhawna et al., 2024). Aligning organizational strategy with circular economy principles entails '*transitioning from the linear "take, make, dispose" approach to designing products and processes that prioritize extended usage cycles, waste reduction, and material recovery*' (Bhawna et al., 2024, p. 1053). However, this requires the acquisition, processing, and exchange of information within and across organizations within the supply chain, leading to the hypothesis that digitalization capabilities could contribute to innovative and circular business models (Patrucco et al., 2025).

In the context of sustainability and circularity, digitalization capabilities enable organizations to enhance their competitive advantage by adopting and implementing digital technologies that improve their sustainable performance. Several such digital technologies have been shown to contribute to improved sustainable performance and sustainable reporting (Kokkinou, 2025; Mehedintu & Soava, 2023). For example, machine learning algorithms can improve forecast accuracy, thereby reducing overproduction, surplus inventory, and associated waste. Internet of Things (IoT) sensors and Blockchain technology can be used to track products across the supply chain, increasing transparency and visibility, and improving sustainability reporting. Big data analytics can improve sustainability by enabling organizations to make more complex decisions that involve a broader set of variables and criteria. Digitalization capabilities can thus serve as a foundation for exploring alternative sustainability scenarios and informing sustainable decision-making. Nevertheless, the mechanisms through which organizations should develop their digitalization capabilities in support of circular business models remain poorly understood (Patrucco et al., 2025), motivating RQ1.

A specific digitalization capability, DAC, has been identified as an enabler of improved supply chain performance, supply chain resilience, and competitive advantage (Kokkinou et al., 2023). DAC is defined as an organization's capability to deploy data, technology, and people to quickly access and analyze information in

support of complex decision-making (W. Yu et al., 2021). DAC is conceptualized as a dynamic capability as it allows organizations to sense their environment (e.g., by identifying new demand patterns), seize opportunities (e.g., by using data-driven decision-making to evaluate alternatives), and make progress towards transforming and reconfiguring their activities (e.g., through improved knowledge management) (Kokkinou, 2024). In the context of sustainability and circularity, a well-developed DAC is linked to an organization's ability to facilitate stakeholders, both within and outside the organization, in making transparent sustainability-related choices by drawing, among other sources, on product and service lifecycle data (Christmann et al., 2024). Critically, however, DAC depends on the availability and quality of data from supply chain partners. If suppliers are unable or unwilling to share data, DAC will have limited effectiveness, underscoring the importance of trust as a precondition for DAC development in the context of the twin transition.

In the context of sustainable supply chain performance, an important yet frequently overlooked antecedent is supplier trust (Gualandris & Kalchschmidt, 2016). Buyer-supplier trust is described as an organization's confidence in the reliability and integrity of its supply chain partner, within an exchange relationship based on the expectation of cooperation (Gualandris & Kalchschmidt, 2016; Moorman et al., 1992). In the context of sustainable supply chain practices, Anisul Huq et al. (2014, p. 630) showed that "*a combination of monitoring and trust building, actively developing and training suppliers, and taking the cultural context into account may be the most efficient way forward.*" In the context of supplier collaboration, Braziotis and Tannock (2011) distinguished between contractual, enabling, and enhancing factors. Once contracts have covered the explicit aspects of the relationship (contractual factors), the practical aspects of the relationship (enabling factors, such as the levels and methods of information sharing) kick in, influencing the implicit aspects of the relationship (enhancing factors, such as trust and commitment). Trust is a form of non-economic influence among supply chain partners (Parmigiani et al., 2011) and is closely linked to supply chain collaboration. It is a relational capability that organizations can develop to promote flexibility and innovation. While digitalization capabilities have received extensive attention as facilitators of information exchange across organizational boundaries, they are contingent on supply chain partners' willingness to share information and, by extension, trust. First and foremost, information sharing is needed for supplier audits and assessments. More broadly, trust between supply chain stakeholders facilitates knowledge transfer (Parmigiani et al., 2011).

Open dialogue and trust between supply chain partners also facilitate joint problem-solving. Trust between supply chain partners can also support investments in relationship-based assets (Parmigiani et al., 2011). In addition to intangible assets such as recycling practices and patents, these can include tangible assets such as remanufacturing equipment or the development and implementation of new production lines. To summarize, buyer-supplier trust emerges as a relational dynamic capability that enables both the information flows required for DAC (RQ1) and the collaboration required for sustainable supplier management (RQ2).

3 Methods

A longitudinal in-depth case study was used to investigate the transition of a mid-sized focal company from a linear to a circular business model. In-depth case study research is particularly appropriate for the study of emerging and complex phenomena, such as the transition to a circular business model, where prior empirical research is scarce, but an opportunity to examine it in the field arises (Heldt & Pikuleva, 2025). The unit of analysis for the study was the focal company and its supply chain.

The selection of the focal case for the present study was serendipitous. Based on purposive sampling, the focal case company was selected in 2021 for its strong sustainability orientation and geographical proximity to the researchers. After two waves of data collection in 2022 and 2024, it came to the attention of the researchers that the focal company had successfully "closed the loop" and data collection was therefore resumed. During each data collection wave, unstructured interviews were conducted with key informants from the focal company. Additionally, internal company documents, publicly available sustainability reports for the period 2021-2024, and press releases linked to third-party sustainability and/or entrepreneurship award nominations were collected and analyzed to complement, validate, and triangulate the interview findings. The preliminary findings highlighted the substantial role of suppliers. Therefore, additional data collection with suppliers, IT suppliers, and other members of the company's ecosystem has been scheduled but not yet completed, as shown in Figure 1. The preliminary findings are therefore subject to bias, as the data captured only opinions and perspectives from the focal company.

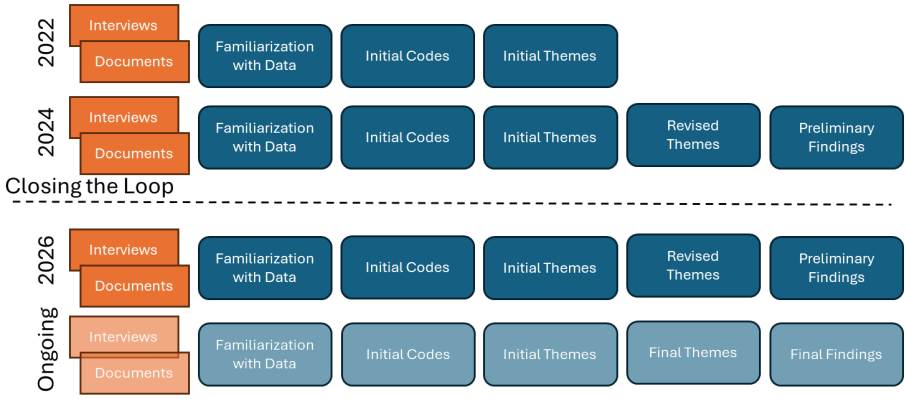

Figure 1: Data Collection & Analysis Timeline
Source: Authors' Own Work

The focal company is a Dutch family-owned mid-sized textile company. This B2B company aims to produce sustainable clothing following a made-to-order business model. The focal company embraces inclusivity. This implies that sustainability objectives need to be balanced against affordability, and that clothes produced need to fit a variety of body types. The company has been in existence for approximately 20 years. The design of clothing and the commercial activities take place in the Netherlands, while clothing manufacturing is outsourced to companies in China. The organizational and cultural context of the study is thus quite distinctive, as it takes place at the intersection of Dutch and Chinese cultural contexts, where the former is characterized by strong individualism and the latter by guanxi, while the long-lasting relationships at its heart are made possible by the Dutch company's family ownership. While the focal company has embraced sustainability since its inception, it was constrained in its early years by available technology and production processes. It iteratively developed and/or adopted new production techniques in cooperation with its suppliers, enabling it to reduce the volumes of water, dye, and chemicals it used and to lower CO2 emissions. As these changes required adjustments to production and other supplier processes, it further developed close collaborations with its Chinese suppliers, involving them in research & development activities. Furthermore, it prioritized monitoring its Tier 1, Tier 2, and Tier 3 suppliers for social sustainability. The focal company also proactively embraced sustainability reporting to communicate transparently with customers and other stakeholders.

Table 1: Sample of Themes, Codes and Illustrative Quotes (not exhaustive)

Theme	Code	*Illustrative Quote* [Data Source and Date]
Emphasis on Measurable Impact	Preference for 'impact' over 'sustainability'	*"I don't want to be the most sustainable company in the world. I want to make products with impact, and with the right impact* [Interview 2026].
	Quantification through LCA and product testing	*"we do a lot based on data. Everything is tested based on functionality, physical properties, and sometimes chemical properties. LCAs are used for all major material decisions"* [Interview 2026].
	Third-party certifications and audits	*In addition, [focal company] invests in initiatives and certifications such as the Business Social Compliance Initiative (BSCI), the Global Recycled Standard (GRS) and Green Button to ensure that all processes are carried out under defensible conditions.* [Jury Statement of Award Nomination, 2022]
Experimentation and Data-Driven Decision-Making	Innovation initiated without pre-existing data	*'It's not like we first have a whole lot of data before we say "hey let's try this"* [Interview 2026]
	Structured experimentation and validation process	*We have a process where (1) we define what circular, affordable, functional means, (2) explore alternatives, (3) experiment with promising options (4) validate with data and LCA and (5) decide on launch* [Interview 2026]
	Data validates rather than initiates	*you don't wait until you have the data to experiment, the goal of the experiment is to get the data.* [Interview 2026]
Trust / Relationship with Suppliers	Long-term supplier relationships	*Together with its Chinese partners [names of suppliers], [focal company] has been pursuing the goal of making its supply chains sustainable and fair for over 20 years.* [Jury Statement of Award Nomination, 2022]
	Personalized rapport with each supplier	*At each team meeting [with the Chinese office], I would bring chocolate bonbons. With COVID I could not travel, so I had them shipped* [Interview 2022]
	Close collaboration enabling supplier investment in new capabilities	*Through significant investments of time,resources, and capital, we've built long-term partnerships with key players across our value chain. Together, we've developed strategies to promote sustainable resources, ethical labour practices, and responsible processes, ensuring that our growth is both shared and sustainable.* [Sustainability Report 2023-2024]

Source: Authors' Own Work

Thematic analysis was used to code the full set of interview transcripts, interview notes, and internal and external company documents, following the procedures of Braun and Clarke (2006). After each round of data collection, the researchers familiarized themselves with the data and coded it using a combination of inductive and deductive coding. Subsequently, initial themes were formulated, iteratively refined, and named. After the second round of data collection in 2024, preliminary findings were documented in a case description. After the company's successful "closing of the loop" and corresponding rebranding, another round of data

collection was conducted in early 2026. The procedures were repeated on the complete dataset, and the resulting themes were documented in the present manuscript. Table 1 illustrates this process using a small subset of themes, codes, and data.

4 Preliminary Findings

The preliminary analysis of the data collected so far highlighted several aspects linked to digitalization capabilities that enabled the case company to transition from a linear to a circular business model, as illustrated in Figure 2:

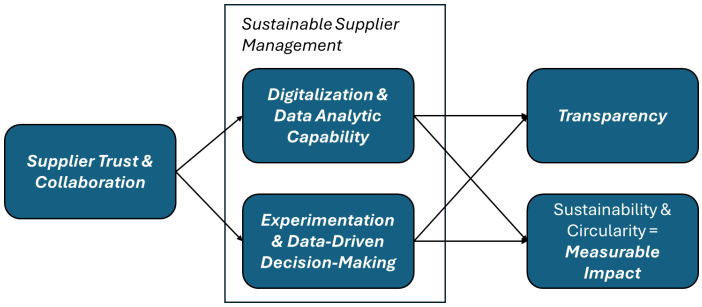

Figure 2: Results of Preliminary Thematic Analysis
Source: Authors' Own Work

Focus on Measurable Impact. The focal company consistently frames sustainability as something that must be demonstrably through measurement, and not merely as an abstract moral ideal. The CEO emphasizes the importance of making products with the *right* impact. This is quantified in liters of water saved and kilograms of CO2 reduction per item of clothing. Life Cycle Analyses (LCAs) are the primary tool for this and are also applied consistently to major product and material decisions. However, the *right* impact is also assessed in relation to product functionality, affordability, and commercial viability. This multi-stakeholder perspective is particularly relevant given the focal company's objective to offer affordable yet sustainable clothing. This focal company's data-driven orientation is clearly linked to its anti-greenwashing position: sustainability achievements must be earned through measurement, not merely claimed. As noted by the CEO during the interviews: "*for me, the most important is to show impact, and to validate that what we say we do, we really do achieve.*" The company's sustainability reports operationalize this

position by providing transparency and concrete key achievements, along with a roadmap to a specific date. A comparison of sustainability reports over time supports the growing importance of evidence-based sustainability reporting, not only in terms of KPIs, but also through certifications and audits.

Transparency in the supply chain. For the focal company, supply chain transparency is both a strategic priority and an ongoing operational challenge. The company has made significant investments in supply chain visibility. It uses a third-party supplier to track its orders across the supply chain using Blockchain technology. Retailers can use it to collect and verify product and supply chain data directly from the primary source. Even though data provision is required of suppliers, data collection from them remains fragmented. Not all suppliers see the added value in providing the requested information, and the quality of the data they provide also varies. Even though some data comes from Blockchain, much is still shared via Excel sheets of varying completeness and quality. Internally, the sustainability report is still compiled through an annual process of pulling data from multiple siloed sources. The focal company aspires to implement a dedicated supplier portal to standardize data entry and improve data quality.

Experimentation and the use of data insights to support decision-making. The focal company operates according to a deliberate logic of experimentation. New project opportunities are pursued based on clear strategic intent and reasoning, without pre-existing data, as such data is usually unavailable at the outset of the project. The project typically begins with defining an objective, such as a circular, functional, and affordable alternative, followed by an exploration of possible solutions. Once a plausible solution is identified, experimentation begins. The experimentation also generates the data required to validate or reject the project opportunity. As an interviewee describes: "*we do a lot based on data. Everything is tested based on functionality, physical properties, and sometimes chemical properties.*" The company's sustainability report confirms this, identifying company-specific techniques developed through internal innovation and subsequently validated through LCA and product testing. Furthermore, the focal company clearly recognizes the threats of data-driven decision-making for innovation. Waiting until data is available prior to initiating a new project may lead to delays and missed opportunities. As an interviewee explained: "*you don't wait until you have the data to experiment, the goal of the*

experiment is to get the data. […] *Don't go looking for all kinds of data before deciding to try something. You lose a lot of speed that way.*"

Role of Digitalization and DAC. The focal company recognizes digitalization as essential for better sustainability decisions. As an interviewee explains: "*my idea is that you really need digitalization to make better decisions regarding circularity*." However, the current state shows a significant gap between the company's internal data maturity and its ability to capture data across its supply chain. Internally, the company's "own" data is well captured and consistently used for data-driven decision-making. Important decisions based on measurable impact, such as actual reduction in CO2 emissions, water usage, etc., through e.g., LCAs. However, as manufacturing and other supply chain processes are outsourced, the focal company needs data from its suppliers. This data collection is still taking place ad hoc: some data is captured via blockchain technology, while other data is provided by suppliers using Excel sheets, requiring varying effort to safeguard data quality. The focal company would prefer to collect data in real time. However, this requires significant investments in digital tools (e.g., a supplier portal) and in relational work.

Relationships with Suppliers. For the focal company, building a sustainable supply chain is as much a people project as a technical one. Supplier relationships at the focal company are explicitly long-term, trust-based, and personal. The CEO visits suppliers regularly and invests significant time in building genuine rapport. This rapport is tailored to each individual, as some are convinced by data, others by commercial continuity, and yet others by social interaction. This depth of relationship also serves a strategic function: suppliers who trust that orders will not disappear overnight are far more likely to invest in new production lines, adapt to unfamiliar materials, and accept the added complexity occasionally required by sustainable production. Furthermore, suppliers engaged in such longstanding relationships are more likely to undertake the collaborative R&D that is necessary "to close the loop". The CEO rejects the transactional view that suppliers should be abandoned after a single mistake. Instead, he expressed strong support for a collaborative approach, saying in the context of sustainable practices: "*alone I can do a lot, but together we can get everything done.*" However, these relationships were not unconditional. Suppliers who refused to engage with the sustainability direction were let go, even after decades of collaboration. Supplier trust is also seen as a prerequisite for data sharing. Suppliers are willing to provide data and invest in data quality,

however, within the context of the buyer-supplier relationship. As an interviewee summarizes, "*I think you first need to have trust in the supply chain. Only then can you get the data […] transparency only comes after maintaining good relationships with your suppliers.*"

5 Discussion

The present study set out to examine two research questions. Regarding RQ1, the findings demonstrate that supplier trust is an enabler of the data flows that support the development of DAC. The company's ability to conduct LCAs, report on CO2 reductions, and build a real-time sustainability dashboard depends on the willingness of Tier 1, Tier 2, and Tier 3 suppliers to share accurate and timely data, supporting Parmigiani et al. 's (2011) view that trust is essential to information exchange. A well-developed DAC, in turn, enables the organization to make data-driven decisions about which sustainable practices to pursue. However, the study findings nuance the role of data in the innovation process, finding that a data-driven approach can act as an inhibitor. DAC plays a relatively limited role in the initiation phase of innovation, and becomes more relevant during the validation phase, when data from product testing and LCAs inform decision-making. The study thereby contributes to our understanding of the role that DAC plays in sustainable transition by demonstrating that a requirement of data-driven justification early in this process can impede innovation and progress towards more sustainable practices (Annarelli et al., 2021). It illustrates Patrucco et al.'s (2025) view that the effectiveness of digital tools in enhancing sustainable performance is contingent on how organizations integrate them into their sustainable practices. Regarding RQ2, the findings point towards trust-based supplier relationships acting as an enabler towards the development of sustainable supplier management capabilities over time. The transition to a circular business model was made possible by collaborative research & development activities undertaken by the focal company with suppliers. The case findings also provide further support for Anisul Huq et al.'s (2014) call for a more collaborative relationship between supply chain stakeholders. Yet, our findings somewhat contradict Braziotis and Tannock (2011) who find that information exchange precedes relations of trust, reversing the order in their model. Our findings show that trust and commitment (enhancing factors) are needed for information exchange (enabling factors). Together, the findings suggest that trust acts as dual enabler for the twin transition: it supports both the data flows needed for digitalization

capabilities (RQ1) and the collaborative investments needed for sustainable supplier management (RQ2).

The present study makes several contributions to the theoretical underpinnings of the twin transition by examining it from a business perspective and at the organization level (Belhadi et al., 2022; Tabares et al., 2025). First, the present study empirically substantiates the role of supplier trust (Gualandris & Kalchschmidt, 2016) as an antecedent of both DAC and sustainable supplier management capabilities, which have until now mostly been studied in isolation. By examining them jointly, the present study demonstrates that they are mutually reinforcing: trust-based relationships generate the data needed for impact measurement (Schilling & Seuring, 2024), while data credibility can, in turn, reinforce supplier confidence and commitment to the partnership. Second, the study supports and extends the DCT framing of the twin transition by identifying trust as a relational dynamic capability that supports the previously identified digitalization capabilities (Annarelli et al., 2021; Mehedintu & Soava, 2023). Third, the findings challenge the assumption that data sharing is primarily a technical challenge. Instead, the study findings support Galandris and Kalchschmidt's (2016) view that sustainable supplier management is a higher-order capability that depends on relational antecedents. From this perspective, these relational antecedents are at least as important as the technical infrastructure.

The present study is subject to several limitations. First, the findings are based on preliminary data from a single longitudinal case study, which limits their generalizability. While the case offers rich contextual insights, future research should examine the role of supplier trust in enabling the twin transition across multiple organizations and industries. Second, data collection so far has focused primarily on the focal company's perspective. Interviews with suppliers, partners, and other supply chain partners should provide a more comprehensive picture of the relational dynamics at play. Third, as noted by Galandris and Kalchschmidt's (2016), buyer-supplier trust may operate differently across cultures and contexts. In the particular context of this study, collectivism and guanxi may facilitate the development of relational capabilities in ways that differ from other contexts. Future research should therefore examine whether the trust mechanisms captured in this study hold across different cultural and contextual settings.

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