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Abstract

Purpose- This study examines how social capital's cognitive and relational dimensions enable effective resource orchestration for blockchain implementation in global supply chains. It reconceptualizes blockchain implementation as a dynamic, cyclical process shaped by evolving inter-organizational trust and collaboration.

Design/methodology/approach- Adopting an abductive, multi-case qualitative methodology, this study examines data collected from a UK-based food manufacturer and nine of its suppliers from developing economies. Primary data, along with secondary documents, is analyzed using Social Capital Theory as the primary lens and Resource Orchestration Theory as a secondary lens.

Findings- Findings reveal that while structural capital is foundational, advanced cognitive and relational capital are vital for successful blockchain implementation. Features of blockchain, like immutability and automated verification, enable trust to shift from interpersonal to system-based. Challenging linear models, the study shows a recursive loop where blockchain reinforces social capital, enabling ongoing collaboration and capability building.

Originality- This research contributes a novel integrative framework linking social capital and resource orchestration in a digitally mediated context, a perspective largely overlooked in the existing literature. It challenges deterministic blockchain implementation models by introducing a co-evolutionary perspective grounded in trust dynamics.

Practical implications- Managers should approach blockchain not merely as a technological upgrade but as a relational transformation. Successful implementation requires phased trust-building, capability alignment, and tailored orchestration strategies suited to the digital maturity of supply chain partners.

Keywords- Blockchain, Social Capital, Resource Orchestration, Cyclic Relationship, Supply Chain.

1. Introduction

Organizations are increasingly collaborating with suppliers and leveraging institutional technologies such as blockchain to optimize, integrate, and align global supply chain processes with marketing strategies. However, a study by McKinsey & Company found that many organizations still lack full visibility into their upstream supply chain partners (Alicke et al., 2021). These vulnerabilities have been highlighted in several high-profile cases. For example, McDonald's witnessed a 6% drop in its stock price following an E. coli outbreak (Saker-Clark, 2024). Similarly, Tyson Foods incurred over $700 million in losses due to supply chain disruptions precipitated by the COVID-19 pandemic (Kauffman, 2021). Beyond corporate examples, global events have had severe repercussions for supply chain stability. The Suez Canal blockage, which resulted in an estimated $9.6 billion in trade losses, further underscored the financial consequences of limited visibility and coordination along complex supply networks (Li et al., 2024).

The potential of blockchain technology is immense in addressing the abovementioned problems. The existing body of literature predominantly focuses on its operational, algorithmic, and system-level aspects (Govindan et al., 2024; Hooper and Holtbrügge, 2020; Karakas et al., 2024) or its conceptual aspects, often supported by anecdotal evidence (Großmann et al., 2024). Literature has evidenced that without the facilitating conditions of supply chain collaboration and resource orchestration, blockchain implementation in supply chains tends to fail (Queiroz et al., 2021; Gong et al., 2024). Scholars, including Gligor et al. (2022) and Silvestri et al. (2023), have applied resource orchestration to facilitate effective blockchain implementation by acquiring, bundling, and leveraging resources. Resource Orchestration Theory provides a framework to understand how organizations manage, structure, and deploy their resources to maximize value (Gligor et al., 2022). To realize these benefits, all stakeholders need to work collaboratively (Akram et al., 2024). By fostering trust, sharing data, and integrating processes, stakeholders can overcome challenges related to siloed operations, limited interoperability, and resistance to technology integration. In the literature, Social Capital Theory has been widely applied to examine how networks, relationships, and social interactions influence the implementation of technology (Zhang et al., 2023). By leveraging social capital, organizations can create a supportive environment that encourages the seamless integration of technology into existing systems and processes (Oparaocha, 2016). Social influence, particularly from trusted individuals, plays a key role in accelerating blockchain diffusion within networks. Leveraging social capital among supply chain business partners can help address challenges related to limited awareness and technical expertise (Taylor & Rosca, 2023).

While Resource Orchestration focuses on internal capabilities and resource management (Skipworth et al., 2023), Social Capital Theory emphasizes the relational and network-based factors that shape collaborative efforts (Jokisaari et al., 2024). However, the understanding of the interplay between collaboration and resources required for blockchain (both technological and non-technological) remains limited (Zhu et al., 2022). In particular, how collaboration enables organizations to effectively leverage resources for technology implementation and deployment remains underexplored. Due to this limitation in knowledge, organizations struggle to utilize the full potential of blockchain, especially in global supply chain settings. This gap in the existing literature has motivated our research. Following Alvesson and Sandberg's (2024) framework on phenomenon construction in this article, we have examined how different dimensions of social capital influence the mechanisms of resource orchestration for successful

blockchain implementation in the global supply chain context. This contextual backdrop triggers the following research questions:

1. *How does social capital (especially cognitive and relational) between buyer and supplier organizations facilitate effective resource orchestration in supply chain management?*
2. *How do social capital and enhanced resource orchestration jointly influence the successful implementation of blockchain technology across different stages of digital maturity?*

To address the above research questions, we collected data from a focal buyer organization in the UK and nine of its suppliers located in developing nations. These suppliers maintain varying levels of collaborative relationships with the focal organization and are at various stages of blockchain implementation. This study offers a novel integrative framework that advances theoretical understanding and practical implementation of blockchain. First, it reconceptualizes blockchain implementation as a cyclical, multi-phase process rather than a linear, deterministic progression. It highlights how blockchain success is recursively shaped by evolving trust structures and inter-organizational learning. Second, it demonstrates how cognitive and relational social capital dynamically interact with resource orchestration mechanisms, enabling the acquisition, integration, and strategic deployment of resources for blockchain-driven supply chain transformation. Third, the study advances network-level theorizing by showing how focal organizations not only coordinate internal capabilities but also orchestrate digital readiness across asymmetric buyer–supplier relationships, especially within the context of developing-country suppliers. Fourth, it introduces a temporal trust transformation model, showing how trust evolves from interpersonal to system-based as blockchain implementation matures. These contributions collectively challenge prevailing assumptions that treat social capital as a static enabler and resource orchestration as a purely intra-firm process. These findings offer practical guidance for decision-makers in buyer organizations and their suppliers, highlighting the need to nurture cognitive and relational capital to maximize blockchain's value in global supply chains.

The structure of this manuscript is as follows: Section 2 presents the literature review, while Section 3 outlines the research methodology. Section 4 presents the phase-wise development of the resource orchestration as derived from the empirical findings. Section 5 discusses the empirical findings in depth. Section 6 discusses the contributions of the research through implications for research and implications for managers. Finally, Section 7 concludes the paper by outlining the implications and suggesting directions for future research.

2. Literature Review

The literature review is structured into three subsections. First, we examine existing research on blockchain implementation in supply chains. Next, we explore the role of social capital in influencing blockchain implementation. Finally, we discuss Resource Orchestration Theory and its relevance to blockchain implementation.

2.1 Literature on Blockchain in Supply Chains

Scholars have used various theories to study blockchain integration, each providing unique insights and addressing others' limitations. For example, Institutional theory highlights how external pressures drive blockchain adoption to meet industry norms, but it overlooks internal resource coordination and strategic decision-making essential for successful implementation (Hartley et al., 2022). Resource-Based View (RBV) mitigates some of these limitations by exposing how organizations can leverage internal capabilities to accumulate blockchain-driven competitive advantages (Liu et al., 2022). However, it offers limited insight into how blockchain tackles market uncertainties and transaction inefficiencies. Information Processing Theory fills this gap by emphasizing blockchain's role in enhancing data integrity, reducing ambiguity, improving visibility, and enabling agile decision-making (Dubey et al., 2022; Jia et al., 2020). Yet, it falls short in addressing structural and transactional shifts in governance. Transaction Cost Theory adds to this by explaining how blockchain reduces information asymmetry and monitoring costs (Schmidt & Wagner, 2019), but it neglects broader institutional and stakeholder complexities. Stakeholder Theory compensates by framing blockchain as a multi-stakeholder system requiring transparency, inclusivity, and alignment among diverse entities (Chowdhury et al., 2023). For blockchain to thrive, strong relational foundations are vital to foster collaboration and reduce resistance to change. Coordinated integration of key resources is essential to align stakeholder objectives and support effective implementation. As blockchain technology matures, adaptability to evolving relationships and resource demands is crucial for sustaining long-term, value-driven outcomes. Without this foundation, stakeholder transparency, efficiency, and inclusivity are compromised. To address these theoretical gaps, Social Capital Theory and Resource Orchestration Theory provide valuable perspectives. Social Capital Theory emphasizes the relational and cognitive dimensions needed to build strong partnerships (Galati, 2022). Resource Orchestration Theory explains how managers strategically bundle and leverage resources, both tangible and intangible, to unlock blockchain's potential within complex supply networks (Gligor et al., 2022; Skipworth et al., 2023). The next two sections present a discussion on the literature of Social Capital and Resource Orchestration Theory, respectively, in blockchain implementation settings.

2.2 Literature on Social Capital in Blockchain Implementation

Social capital refers to the networks, relationships, and interactions that support cooperation and resource access. It has three dimensions: structural, cognitive, and relational (Nahapiet & Ghoshal, 1998; Elliot et al., 2015). The above dimensions of social capital have been discussed in the context of blockchain integration. For example, examination of the influence of structural aspects and trust on individual and organizational dynamics (Queiroz and Wamba, 2019) and identification as a critical precursor to blockchain integration (Treiblmaier, 2018; Wang et al., 2019). However, these studies have not fully clarified the strategic role of social capital within the context of the supply chain. Galati (2022) extended this understanding by emphasizing the importance of cognitive and relational capital as they foster trust, shared understanding, and collaborative behavior essential for successful implementation. Kusi-Sarpong et al. (2022) highlighted the role of human, organizational, and social capital in shaping organizations' readiness to implement blockchain-driven supply chains. Nagariya et al. (2024) emphasize the importance of trust, coordination capabilities, and market sensitivity in enabling blockchain to

improve responsiveness, mitigate risks, and enhance supply chain resilience. Similarly, Benzidia et al. (2021) demonstrate how integrating relational social capital with blockchain technology promotes innovation ambidexterity by balancing resource exploration and capability exploitation. Shahzad et al. (2024) argue that current research mainly addresses the early adoption of blockchain in an organizational context. The authors further highlight limited insight into how power dynamics, relationships, and collaboration develop during implementation in inter-organizational contexts and impact resource integration. To gain a deeper understanding of how resources can be acquired and effectively deployed for blockchain implementation within inter-organizational networks, it is essential to explore the link between sustainable collaborative relationships and resource orchestration (Queiroz et al., 2021; Gong et al., 2024). The following section delves into Resource Orchestration Theory and its implications for blockchain integration.

2.3 Literature on Resource Orchestration in Blockchain Implementation

Resource Orchestration Theory, an extension of Resource-Based Theory (RBT) it provides a framework for organizations to maximize the potential of resources (Sirmon et al., 2011). Resource Orchestration Theory has illustrated that superior performance arises from the complementarity of resources, capabilities, and strategic actions (Koufteros et al., 2014). This theory elucidates how organizations' structure, bundle, and leverage resources to generate value, revealing the internal processes that convert resources into a competitive advantage (Sirmon et al., 2007). Gligor et al. (2022) further added that understanding the stages of resource orchestration enhances value creation while increasing supply chain transparency. The potential for creating competitive advantages using technology has attracted several research studies that apply the concepts of Resource Orchestration Theory. For example, to achieve supply chain integration (Liu et al., 2016), to understand the users' experience and challenges faced during blockchain integration (Sodhi et al., 2022), to understand the mediating role in the technology sensing capability and firm performance relationship (Li et al., 2023), and to adopt blockchain technology to support supply chain finance (Gong et al., 2024). Despite its potential, Resource Orchestration Theory often fails to explain the unsuccessful implementation of blockchain due to its unidirectional nature (Sodhi et al., 2022). Similarly, Bals et al. (2023) argued that organizations need to go beyond economic resources and liaise with a broader network of stakeholders by leveraging social intermediate entities for effective resource orchestration over the long term. Yet, the interconnectivity among theories explaining technology implementation (blockchain in our case) is limited. Furthermore, successful blockchain integration requires the coordination of incentives for the involved stakeholders within the supply chain to achieve the information sharing required for resources to be integrated (Gong et al., 2024). However, limited understanding exists of addressing these inter-organizational issues (Gligor et al., 2022).

In summary, the literature underscores the vital role of stakeholder collaboration, including resource allocation and coordination, in optimizing blockchain implementation. Resource Orchestration Theory (Gligor et al., 2022) supports strategic resource management, while Social Capital Theory (Galati, 2022) stresses trust, shared norms, and networks for effective collaboration. Examining these theories separately may yield fragmented insights (Sodhi et al., 2022). To overcome this, a holistic approach is needed to explore how internal resource strategies and external relational dynamics jointly shape blockchain implementation. This

study proposes a framework examining the interaction between social capital and resource orchestration and their combined influence on successful blockchain adoption.

3 Research Method

In this research, we adopted a qualitative methodology, which is particularly suitable for examining the nuanced relationships (Bansal et al., 2018). Unlike quantitative methods, the qualitative method adopted in this research provides greater flexibility in capturing the complexity of trust, collaboration, and strategic resource alignment processes (Jamieson et al., 2023). It not only enriches our understanding of how and why collaboration shapes both technological and non-technological resource orchestration, but it also helps us to address the intricate interplay of these factors throughout the blockchain implementation process. To ensure the rigor and credibility of the research design, we adopted multiple well-established measures outlined in previous blockchain-related qualitative studies (Galati, 2022; Tönnissen & Teuteberg, 2020). Details of these measures are provided in Table 1.

<Include Table 1>

3.1 Research Context and Case Selection

Primary data were collected from a UK-based food manufacturer and its suppliers in developing countries. The UK food sector was selected due to its distinct characteristics, namely its complexity and strict regulatory requirements related to traceability, sustainability, and transparency, which make it a relevant context for studying blockchain integration. Our case selection followed a theoretical replication logic. In line with Yin's (2018) guidelines, we chose cases that could meaningfully inform the research questions. Specifically, we purposefully selected nine buyer–supplier dyads from the focal firm's supply base that varied across three key dimensions: (1) the level of relational and cognitive social capital between buyer and supplier (low, moderate, high), (2) the stage of blockchain implementation (partial, or full implementation), and (3) the extent of resource integration and coordination (from minimal to extensive). This variation enabled us to examine how different inter-organizational dynamics influence resource orchestration and blockchain implementation outcomes. Our aim was not literal replication of similar cases but rather to explore contrasting conditions under which theoretical patterns would emerge. The selected dyads reflect the diversity typical of UK food supply chains, particularly in terms of global sourcing of perishable goods and varying levels of supplier digital readiness. This diversity enhances the transferability of insights to comparable contexts. The approach strengthens the explanatory power of our analysis by capturing contrasting patterns, aligning with best practices for multiple-case study design in qualitative research. We employed a purposive sampling strategy, a common non-probability technique in qualitative research (Patton, 2015), which allowed us to select cases particularly relevant to our research questions. We collaborated with a focal firm known for its advanced use of supply chain technologies, including recent blockchain initiatives. Based on discussions with key managers (procurement and supply chain) and a review of historical reports on long-term partnerships, joint ventures, and collaborative projects, we identified nine suppliers from developing countries within their supply base. These cases provided sufficient depth to explore the phenomenon while maintaining a balance between data richness and manageability (Eisenhardt, 1989; Barratt et al., 2011). We believe the selected cases offer enough diversity to

generate theoretical insights applicable to other research settings where supply chains are governed by similar regulatory and institutional conditions.

3.2 Data Collection

We conducted 30 semi-structured interviews over three months in 2024 (Table 2), aligning with similar studies to capture diverse managerial insights (Saunders & Townsend, 2016). Interviews lasted 40–75 minutes and were held online to accommodate geographic diversity. We employed a semi-structured interview format using interview questions outlined in Table 3 to facilitate a balance between structured discussion and the flexibility to explore emerging themes (Corbin and Strauss, 2014). By adopting this approach, we were able to collect nuanced data on varying levels of collaboration and resource integration between the buyer and its supplier organizations. During the interview, we also used open-ended probing questions to uncover unanticipated information (Galletta and Cross, 2013). We also ensured that participants' anonymity was maintained and allowed interviewees to review the transcripts for accuracy.

<Insert Table 2>

<Insert Table 3>

In this research, we used additional data sources to triangulate with interview transcripts. These sources include (i) archival materials, both online and provided by the buyer and supplier, and (ii) expert validation. The archival materials offered background information on the organizations, including their policies and procedures around any institutional technologies. To ensure the internal validity of the study's findings, we engaged in an expert validation step by consulting with four experts from two UK food sector consulting organizations. This included informal discussions via Internet-based calls. This expert validation helps avoid retrospective bias (Golden, 1992) and ensures our interview impressions align with secondary data sources.

3.3 Theoretical Hierarchy and Unit of Analysis

In this research, we used Social Capital Theory as the primary theoretical lens and Resource Orchestration Theory as the secondary theoretical lens. Social Capital Theory helped us examine how relationships, trust, and shared understanding enable the effective exchange of resources. Resource Orchestration Theory was then used to explore how these relational benefits translate into activities such as resource structuring, bundling, and leveraging, all critical for blockchain implementation. By prioritizing Social Capital Theory as the primary theory, the study highlights the importance of inter-organizational relationships in achieving successful blockchain implementation. Resource Orchestration Theory complements this by explaining how these relationships are operationalized through resource-based mechanisms. Together, these frameworks provide a comprehensive perspective on how organizations address collaboration and resource-based challenges to implement blockchain in global supply chains. By tracing the causal pathway, how trust reduces risk to enable co-investment (structuring), how shared vision reduces ambiguity to support integration (bundling), and how joint understanding facilitates collaborative deployment (leveraging), we link the social foundation of Social Capital Theory to the strategic actions of Resource Orchestration Theory. The primary level of analysis in this research is the organizational level, with a focus on the inter-organizational dynamics between a buyer and its supplier. The unit of analysis is the

buyer-supplier dyad, where we examine the interplay between social capital dimensions and resource orchestration mechanisms to understand blockchain implementation. This focus is further enriched by exploring each organization's internal resource strategies, offering a holistic view of the blockchain implementation process.

3.4 Data Analysis

We employed an abductive approach. The key reason for our selection was that abductive inquiry is especially well-suited for theory development (Dubois and Gadde, 2002). It allowed us to refine existing theories while remaining receptive to new insights that emerged from the empirical data (Van Echtelt et al., 2008). This approach was specifically chosen for our study because it allowed us to bridge the gap between theoretical constructs and practical realities, thereby fostering a deeper understanding of the relationships among social capital, resource orchestration, and blockchain implementation. We used a non-linear and iterative pattern of data collection and analysis to ensure alignment between theory and empirical observations (Dubois and Gadde, 2002). This iterative process allowed us to continuously revisit and refine theoretical constructs, considering empirical findings. It created a dynamic interplay between the theoretical and practical dimensions. We employed an iterative analytical approach, alternating between deductive and inductive reasoning. Deductive reasoning used established constructs from social capital and resource orchestration theories to guide initial coding and interpretation, offering a structured lens for understanding the data (Ketokivi & Choi, 2014). Simultaneously, inductive reasoning enabled openness to emergent patterns directly from the data, facilitating the identification of insights not captured by predefined constructs (Jia et al., 2021). This dynamic interplay yielded a holistic understanding by integrating established theories with context-specific findings. Our analysis validated the theory in a new setting, enriched academic discourse, and offered practical implications. In line with best practices in abductive qualitative research, we also used contradictory cases in our analysis (Dubois & Gadde, 2002). During our iterative coding process in NVivo, we systematically examined non-confirmatory cases. These cases are dyads where blockchain implementation outcomes deviated from what we found in most of the cases. In our analysis, we have not treated them as anomalies but as theoretically valuable contrasts. By considering these cases, we strengthened the theoretical robustness of our findings. It helped us to ensure that our conclusions reflect both confirming and disconfirming evidence. We evaluated social capital at three levels: low, moderate, and high. Low social capital involves weak cognitive ties, limited shared values, minimal relational bonds, and low trust, resulting in fragmented partnerships. Moderate social capital reflects partial alignment of beliefs and trust, with networks being somewhat connected. High social capital shows strong shared values, high trust, committed relationships, and a cohesive network. Resource orchestration is classified into three distinct stages: structuring, bundling, and leveraging. Structuring refers to acquiring and organizing resources to build a solid foundation. Bundling means integrating resources into new capabilities. Leveraging entails strategically applying these capabilities to exploit market opportunities, enabling managers to transform resources into a lasting competitive advantage.

NVivo 14, a computer-assisted qualitative data analysis software, was employed to organize, structure, and code all the collected data. Initially, data were individually coded using an open-coding method, wherein initial codes were assigned to relevant excerpts (Corbin and Strauss, 2014). Subsequently, NVivo 14's hierarchical coding capabilities were employed to organize these codes into broader categories consistent with our theoretical framework. Figure 1

illustrates a hierarchical framework that guides the data analysis protocol using Gioia's methodology (Gioia et al., 2013). To ensure the dependability and consistency of coding, two researchers independently coded a subset of the interview transcripts using NVivo 14. The initial round of coding focused on identifying first-order concepts based on informant terms. After coding the first six interviews independently, the researchers compared their codes to assess consistency and identify discrepancies using a qualitative consensus approach (Gioia et al., 2013). Coding differences were discussed and resolved through iterative dialogue until agreement was reached on category definitions and code applications. A revised coding framework was then developed, and the remaining interviews were coded accordingly. Regular meetings were held throughout the analysis to ensure alignment and coherence, which supports the rigor and transparency of the findings in line with qualitative best practices (Gioia et al., 2013; Corbin & Strauss, 2014). To reinforce dependability, we maintained a detailed audit trail of code definitions, memos, and analytical decisions in NVivo, consistent with best practices in qualitative research. First-order codes such as "Trust" and "Shared Language" are developed from interview data. They are grouped into second-order codes like "Cognitive Capital" and "Relational Capital", which yield a well-structured and theoretically sound categorization. This visualization supports the cyclical interaction amongst social and resource-based dynamics, observed in this study. Figure 1 serves as the empirical backbone of our proposed conceptual framework. Matrix coding queries were particularly helpful in identifying patterns and relationships within the data. For example, trust and shared consensus were classified under relational capital, while resource integration and mobilization capabilities were included under resource leveraging. These codes were generated by an open-coding process. At the topmost level, the second-order codes were grouped into two central theoretical dimensions, viz., social capital and resource orchestration. Social capital was initially divided into three tiers-low, medium, and high, depending on the observed strength of cognitive and relational capital in the collected data. However, to improve the alignment within theoretical frameworks, these categories were fine-tuned into two broader conceptual categories, viz. 'intermediate' and 'intensify.' During the data collection and analysis process, we followed an iterative approach, simultaneously coding and revisiting emerging themes after every 3–5 interviews. By the 24th interview, our analysis revealed that no new first-order codes were emerging, and the previously developed categories consistently recurred in subsequent data. We conducted six additional interviews (a total of 30) to confirm this pattern, and these interviews reinforced the existing codes without introducing new concepts. This consistency indicated that we had reached data saturation. To support this determination, we monitored code frequency and diversity using NVivo's coding reports and visualized a flattening trend in our code accumulation curve. This is aligned with established saturation practices in qualitative research (Guest et al., 2006; Saunders et al., 2018), which assert that thematic saturation is achieved when additional data fail to yield new theoretical insights or coding categories. The codes were organized into a hierarchical structure with 18 first-order categories and six second-order themes, which were linked to two aggregated dimensions: social capital and resource orchestration, as shown in Figure 1. The example of evidence from the interview code is given in Table 4. We considered the higher-level blockchain implementation as a synthesis of the effective leveraging of the available resources with a higher level of trust and relationships.

<Insert Figure 1>

<Insert Table 4>

4. Empirical Findings

This section outlines the interrelationship between social capital and resource orchestration observed during the data analysis. Our data offers a temporally sequenced explanation of how blockchain implementation is shaped by evolving forms of social capital and unfolds through the sub-processes of resource orchestration phase structuring, bundling, and leveraging. The findings bring into focus the causal backbone between social capital and resource orchestration. The cognitive and relational capital do not merely accompany orchestration. However, they actively enable and shape it.

4.1 Phase 1: Structuring the Resource Orchestration Process for Blockchain Implementation

The orchestration process began with efforts to reduce fragmentation across internal and inter-organizational systems. In our data, it was found that initial investments focused on raising interaction frequency and developing reliable communication channels across departments such as operations, IT, quality, and marketing. It was also evident from the interview: "*[...]We've moved to a shared platform where both sides can track orders, deliveries, and quality checks in real-time. This has significantly reduced delays and errors [...]*" (Participant SEC). This move illustrates structural capital (providing visibility, transparency, and access) and enables organizations to identify obsolete systems and accumulate complementary technologies. Structural capital thus facilitates visibility and information flow, which in turn enables organizations to identify and acquire necessary resources. These foundational actions align with the structuring sub-process of resource orchestration. During the interview, it was found that at this early stage, reputation-based trust and informal norms were developed based on past interactions. One participant mentioned, "*We already had a working relationship, and that gave us the confidence to start making changes together, even before everything was fully mapped out. [...]*" (Participant SBA). This form of interpersonal trust reduced perceived risk and nurtured the initial allocation and configuration of resources, particularly when technical capabilities were asymmetric. The presence of these foundational ties enabled organizations to jointly standardize basic procedures, laying the groundwork for shared technological architectures.

4.2 Phase 2: Bundling the Resource Orchestration Process for Blockchain Implementation

During data analysis, we found that as collaboration matured, organizations shifted their focus to bundling resources into cohesive capabilities. At this stage, cognitive capital became essential, reflected in shared mental models, a common understanding of blockchain functionality, and aligned goals such as food safety and traceability. During the interview, one participant mentioned, "*[...] At first, there was a lot of confusion about what exactly was needed for blockchain integration, but through regular interactions, we've gained clarity and confidence[...]*" (Participant SHA). Cognitive capital enabled shared understanding, which supported the integration of resources into coherent capabilities. This clarification and sense-making enables organizations to agree on a shared implementation roadmap, jointly develop integration protocols, and synchronize documentation and verification routines. We have also found that relational capital evolved during this stage. It was no longer limited to informal trust.

It included faith in each other's strategic intentions and openness to mutual adjustment. This allowed organizations to share sensitive operational inputs and engage in real-time coordination. This was also evident in the interview, "*[...]We've built a decent level of trust with our buyer [...] That trust means we can make quicker decisions and keep things moving forward without second-guessing each other's intentions*." (Participants SIB). "[...] *Bi-monthly check-ins allow both sides to share progress and adjust in real-time, avoiding larger issues down the line [...]*" (Participants SGA). Relational capital at this stage supports flexibility and responsiveness, which are essential for capability refinement. During this phase, trust shifts from interpersonal to cognitive forms. Instead of being rooted in personal relationships, trust is now sustained by institutional routines, shared values, and a common language. *"We're gradually building confidence in each other's capabilities […] This trust is pivotal as we collaborate on improving our supply chain resilience […] If something isn't working on our side, we're upfront about it [...]"* (Participant SAB). This shift reflects a temporal progression in trust, from personal to shared cognitive frameworks, enabling more scalable coordination. These practices highlight how cognitive capital nurtured bundling via mutual understanding. Simultaneously, relational capital developed the flexibility required for process refinement and problem-solving. The result was the joint development of blockchain-driven capabilities such as traceability, inventory transparency, and verification automation.

4.3 Phase 3: Leveraging the Resource Orchestration Process for Blockchain Implementation

The findings reveal that in the final phase, organizations transition from bundling to strategically implementing their integrated capabilities based on customer requirements and market dynamics. The organizations in the leveraging phase started using blockchain capabilities to support their strategy. During the interview, it was mentioned "*[...]We've been working to integrate different systems, our supply chain management software, quality assurance processes, and now blockchain, to ensure comprehensive traceability [...]*" (Participant SAA). This phase marks the deployment of capabilities developed through earlier bundling efforts, guided by strategic goals. At this stage, the form of trust also transformed from interpersonal relationships to system-based, triggered by the demonstrated reliability of blockchain features. This was enabled by blockchain's intrinsic characteristics like immutability, automated verification, and auditability. For example, one participant acknowledged: "*[...]Now that the system works, we don't need to double-check each other anymore, the blockchain just handles it [...]*" (Participant SHA). The evolution follows a sequence: interpersonal trust enables early collaboration, cognitive trust supports capability development, and system-based trust facilitates autonomous execution. The transition from interpersonal to system-based trust indicates an important temporal milestone. Trust became rooted in the technology itself. It enables faster implementation, decentralised oversight, and customer-facing value creation. One supplier explained, "*[...]Since we've implemented blockchain, we've been able to respond faster to market demands for more transparent and traceable food products. The data we collect has helped us tweak our offerings in real-time, giving us an edge in the market[...]*" (Participant SGA). This technology-mediated trust regime was found to be further reinforced by accumulated cognitive and relational capital. Cognitive capital, manifested in shared strategic goals, aligned expectations, and unified interpretations of blockchain value, enabled organizations to coordinate resource deployment with greater precision and confidence. Relational capital, characterized by mutual respect, open

communication, and behavioral transparency, fostered high levels of trust and intrinsic collaboration. Together, these forms of capital enriched mutual understanding and enabled organizations to streamline resource use, enhance value creation, and exploit emerging market opportunities.

4.4 Interplay between Social Capital and Resource Orchestration

During our data collection, we have also observed a recursive relationship. Each phase strengthens cognitive and relational foundations. It creates a feedback loop, which enables sustained collaboration and future innovation. This dynamic evolution forms the causal backbone of blockchain implementation in supply chains. As organizations transitioned through the structuring and bundling phases, each successful orchestration activity served as confirmation of reinforced relational trust and cognitive alignment. It is also acknowledged by an interview participant, "*[...]The more we saw it working, the more confident we became not just in the technology, but in each other's intentions and capabilities[...]*" (Participant SHC). These micro-successes functioned as trust-building episodes. They were particularly important in low-trust environments or where historical collaboration had been transactional. By jointly producing tangible results such as traceable inventory, real-time verification, organizations reinforced beliefs in the reliability, competence, and goodwill of their partners. It further reinforced relational capital. As orchestration progressed, participants developed a more nuanced, shared vocabulary for discussing implementation challenges and resource needs (strengthening cognitive capital). Through continuous coordination, particularly in the bundling phase, both parties developed the capability to learn together. It formed a basis for dynamic capability renewal. This was also reflected in the interview: "*[...] We weren't just solving this project; we were learning how to solve future ones better [...]*" (Participant SHC). This shared learning accelerated the capability to predict bottlenecks, reframe workflows, and coordinate on emerging use cases. In this way, orchestration activities did not just consume existing cognitive capital; they became avenues for its renewal and enrichment. The leveraging phase created a strategic feedback loop. Blockchain implementation enabled organizations to respond to market shifts more swiftly and to jointly create value via differentiated offerings (such as sustainable provenance, data-led shelf-life prediction). These outcomes raised stakeholder buy-in, attracted ecosystem partners, and further incorporated trust and mutual purpose into the relationship. A supplier highlighted this by stating, "*[...]After seeing the market response, we're now having deeper conversations about how to expand the system to other product lines together[...]*" (Participant SBA). Hence, the strategic benefits generated by resource leveraging did not indicate the end of collaboration. However, it set the foundation for the next cycle of orchestration. Social capital, which is usually an enabler, becomes an outcome. It reinforces itself via recursive learning and success. This recursive interplay becomes more significant under conditions of uncertainty. In such contexts, the adaptive capability of the partnership becomes the competitive edge. Social capital enables flexible orchestration, and orchestration efforts that successfully mitigate uncertainty reinforce the relational and cognitive bonds. This is vital for future agility. During the interview, one participant noted, "*[..]each time we hit a bump and solved it together, it felt like the relationship was becoming more resilient*." (Participant SHB). Over time, this joint evolution leads to

institutionalized routines, regular communication channels, and shared governance practices. These are both a product and a driver of digital transformation.

Our investigation found some minor exceptional cases as well. In one case, the supplier reported their struggle to coordinate effectively with the buyer during the implementation phase despite having a close and long-standing relationship with the buyer. These challenges were usually embedded in internal constraints. One participant noted, "*We've worked with them for years and trust is not the issue, but we just didn't have the tech or the staff to keep up[...].*" (Participant SCB). On the contrary, a few blockchain initiatives advanced even in the absence of strong relational capital. As one supplier described, "*I am not sure if we worked that closely with them on the rollout, but they had a clear plan and timeline, so we just made sure to follow it on our end [...]*" (Participant SDC). These outlier cases revealed that relational and cognitive capital, which are generally supportive, are not always adequate or necessary for successful orchestration.

5. Discussion

In this section, we discuss our empirical findings in relation to the prior literature to answer the research question. In doing so, we theorize the impact of social capital and resource orchestration on blockchain implementation. Our study revealed that the successful implementation of blockchain technology depends on a nuanced interplay between structural social capital and resource orchestration. The detailed description of our overall findings is discussed below.

Structural social capital lays the critical groundwork for the blockchain implementation process. It enables the sharing of valuable information, alignment of resource-related processes, and enhancement of shared governance structures (Filipovic and Arsanagic-Kalajdzic, 2023). By fostering an environment of alliances and collaboration, social capital enables organizations to move beyond the siloed perspective often associated with resource management (Stol et al., 2024). Our findings exemplify (Participants SHA and SCA) this by underscoring the significance of standardized procedures, collaborative mechanisms, and pooled resources as foundational elements for blockchain implementation. Nevertheless, possessing only structural social capital was found to be inadequate. Extant literature indicates that the successful orchestration of resources necessitates a strategic outlook that extends beyond mere accumulation (Sirmon et al., 2007; Bals et al., 2023). As evidenced in our interviews (Participants SGA, SFB), the major hurdle lay in transitioning from merely possessing a "stocked pantry of ingredients" to effectively "cooking the food." Based on the above arguments, we put forward the following propositions:

Proposition 1a: Structural social capital between the buyer and supplier sets the foundation for resource orchestration by allowing them to structure their resource portfolio.

Proposition 1b: Structuring the resource portfolio leads to sporadic implementation of blockchain technology, but this alone is not sufficient to achieve effective results.

Building on our earlier discussion before Propositions 1a and 1b, it is evident that a paradigm shift is needed, from prioritizing resource acquisition to the incorporation and effective utilization of resources. In our research, it was found that as organizations begin to align around shared objectives (cognitive capital) and establish reciprocal trust (relational capital), they are more willing to integrate systems, share sensitive information, and jointly develop capabilities. Extant studies highlight the inevitability of orchestrating distinct resources, including technological frameworks, human capital, and data, into an ethical and profitable marketing campaign to enable the successful implementation of blockchain technology (Tan and Salo, 2023). This complexity is further compounded by the inherently dynamic nature of blockchain ecosystems, which necessitate continuous recalibration and innovation (Wamba et al., 2020; Queiroz and Wamba, 2019). Our empirical findings (Participants SIB, SAB, SHB) suggest that a balanced level of shared knowledge and trust, alongside mutual recognition of blockchain implementation, enables organizations to enhance resource pooling. This, in turn, facilitates data collection and sharing with business partners, thereby reducing errors in the process. Such enhancements support the development of new capabilities, such as improving supply chain traceability. These findings are consistent with previous studies on the impact of information sharing between buyers and suppliers in enhancing organizational capabilities to leverage technology (Xu et al., 2023; Capestro et al., 2024). While deep associations are often considered crucial, the initial phase of engagement focuses on exploring the technology and identifying mutually beneficial objectives. While past studies emphasized strong relationships and shared expertise for successful partnerships, our findings align with the growing recognition of the role of weaker ties in facilitating collaboration (Aral and Dhillon, 2023). In the context of blockchain implementation, a balanced level of trust and shared knowledge was found to initially streamline collaboration by reducing complex negotiations and decision-making.

As relational and cognitive capital mature, organizations are better positioned to move from parallel resource arrangements to tightly coupled bundles of capabilities. Shared values enable mutual prioritization of implementation activities, while trust allows partners to manage interdependence without detailed contractual controls, operational, and technological assets. Cognitive capital functions as an enabler of joint learning and innovation. Relational capital ensures the continuity of the relationship, facilitating repeated cycles of utilization of resources through innovation, experimentation, and shared risk-taking. While the bundling stage of resource orchestration strengthens the solid foundation for blockchain implementation, it is insufficient to realize the full potential of blockchain technology (Gligor et al., 2022). These capabilities primarily address initial integration and process efficiency but fall short of managing the complexities associated with scaling and optimizing blockchain systems (Gligor et al., 2022). Extant studies underscore the critical role of augmented resources, such as dynamic capabilities and absorptive capacity, in ensuring long-term success (Zahra and George, 2002). Comprehensive blockchain implementation demands robust security measures, advanced scalability solutions, and continuous recalibration to meet evolving business needs and technological advancements (Upadhyay, 2020). This is also evident in our findings (Participants SIB, SAC). Without these additional layers, organizations may encounter significant challenges, including scalability limitations, security vulnerabilities, and integration bottlenecks, ultimately restricting the transformative potential of blockchain technology (Sanka and Cheung, 2021). Organizations need to develop capabilities to adapt to the evolving landscape of blockchain implementation and strategically leverage these advancements to gain a competitive advantage, thereby expanding their influence. This requires deeper inter-organizational collaborations and the establishment of shared know-how frameworks that foster innovative approaches for seamless knowledge exchange and the development of

problem-solving capabilities (Galati et al., 2022). Empirical evidence (Participants SBB, SBC, SFB, SIC) underscores the importance of strengthening inter-organizational relationships, facilitating knowledge exchange, and promoting collaborative problem-solving to address challenges in blockchain implementation and capitalize on competitive advantages. In the context of blockchain, the need for increased social capital has been highlighted as a critical determinant for successful knowledge sharing, which is essential for driving innovation (Mazzucchelli, 2021). Summarizing the above, we propose:

Proposition 2a: An intermediate level of both relational and cognitive capital between the buyer and supplier facilitates the bundling of the resources required for blockchain implementation.

Proposition 2b: Bundling the resource portfolio supports a partial level of blockchain implementation. However, this is insufficient for the effective full-scale implementation of blockchain technology needed to achieve end-to-end supply chain visibility.

Our research (Participants SBC, SFB) offers novel insights into the distinct influence of advanced levels of cognitive and relational capital on resource orchestration for a buyer integrating with its suppliers. Previous empirical studies have emphasized the crucial role of intangible assets, such as a shared vision, system integration, learning, and trust, in accelerating the coordination and mobilization of skills and resources, which fosters a strong collaborative environment (Ozdemir et al., 2023). This, in turn, creates value by enabling more effective utilization of market opportunities. These findings support theoretical constructs that highlight the synergy between relational and cognitive capital in enhancing the leverage of resources (Nahapiet & Ghoshal, 1998; Subramaniam & Youndt, 2005). When mutual goals are institutionalized and reciprocal trust is deeply established, organizations can autonomously and repeatedly leverage shared resources for strategic gains such as traceability, compliance, and real-time responsiveness. Advanced social capital is not just supportive but catalytic for full-spectrum resource orchestration. Attaining traceability, full transparency (Pinnington et al., 2023), and data integration (Turkulainen et al., 2017) requires a collective effort driven by shared knowledge across the entire supply chain. These theoretical constructs align with our findings. Our study (Participants SBA, SBB) demonstrated how deep-rooted partnerships and shared know-how contribute to the identification and subsequent deployment of key resources. Moreover, the insights from the interviews (Participants SBA, SFB) emphasize the significant impact of relational and cognitive capital on resource optimization. These outcomes underscore the importance of trust**,** shared goals**,** and mutual understanding in effectively managing complex resource orchestration (Agrawal et al., 2023).

Our study contributes to the existing literature by emphasizing the critical role of cognitive and relational capital in the acquisition**,** development**,** accumulation**,** and utilization of resources. These intangible assets are essential for collaborating with partners, evaluating resource compatibility, and facilitating the efficient coordination of resource allocation. Organizations can gain a competitive advantage by effectively coordinating with their stakeholders, mobilizing and deploying resources (Kouhizadeh et al., 2021; Wang et al., 2019). The buyer organization can create significant value through blockchain implementation by working closely with the supplier to enhance transparency and traceability. This study advances prior empirical research (Difrancesco et al., 2022) by demonstrating the practical efficacy of these conceptual frameworks within the specific context of food manufacturing supply chains.

Through our investigation (Participants SIC, SBA), we found that the synergy between relational and cognitive capital enables organizations to foster sustainability**,** enhance operational efficiency**,** and ensure regulatory compliance**,** ultimately strengthening their competitive position in the marketplace. Based on these arguments, we propose the following.

Proposition 3a: As relational and cognitive capital between the buyer and supplier intensifies, it enriches their mutual understanding, trust, and resource coordination, thereby enhancing their capacity to effectively leverage the resources required for blockchain implementation.

Proposition 3b: When relational and cognitive capital are comprehensively established, the leveraging of resources promotes more effective blockchain implementation, thereby driving enhanced value creation and facilitating the exploitation of market opportunities.

Further interview insights (Participants SAC, SBB, SBC, SCC) emphasized how blockchain plays a pivotal role in fostering trust between buyers and suppliers, which is essential for the successful development of collaborative relationships. This enhanced trust enables smoother coordination, better resource integration, and more effective long-term partnerships, which are key to achieving sustained success in blockchain-enabled supply chains. This view aligns with the notion that key features of blockchain technology, such as transparency and immutability, can mitigate supply chain and transactional risks typically caused by a lower level of social capital (Lumineau et al., 2021). Blockchain's ability to create a secure and verifiable ledger reduces the need for high levels of inter-organizational trust and relational depth, especially during the early stages of implementation (Chen et al., 2023). This contrasts with traditional technologies like Enterprise Resource Planning (ERP) systems, which often require substantial inter-organizational trust and alignment due to their broad organizational impact (Gattiker and Goodhue, 2005). However, our study finds that, unlike these traditional technologies, blockchain offers a modular framework**,** enabling the deployment of basic applications even with moderate levels of social capital**.** This flexibility is facilitated by blockchain's inherent features, such as transparency and decentralization**,** which help reduce data inconsistencies and relational risks. As a result, blockchain can be implemented successfully without the need for extensive pre-existing trust (Pattanayak et al., 2024). Summarizing these arguments, we propose the following:

Proposition 4: Successful blockchain technology implementation driven by social capital can itself foster further development and strengthening of relational and cognitive social capital after implementation. This makes the whole process a cyclic one rather than a linear one.

<Insert Figure 2>

Figure 2 outlines our findings by visualizing the cyclical interplay between social capital and the three phases of resource orchestration: structuring, bundling, and leveraging during blockchain implementation. We have highlighted the temporal sequence of trust transformation. In our study, we have found that blockchain implementation begins with interpersonal trust in the structuring phase. In the bundling phase, interpersonal trust advances to cognitive trust. In the leveraging phase, it culminates in system-based trust. Blockchain supports this progression and helps organizations to enhance transparency, immutability, smart

contracts, automated verification, and reduce reliance on interpersonal coordination (Hughes et al., 2019). As systems become operational and automated, the role of relational social capital diminishes (Hardjono et al., 2019). Our data (e.g., Participants SHA, SBB) confirm that blockchain maturity reduces the need for continual interpersonal oversight. In the early stages of blockchain implementation, relational social capital plays a crucial role. Its salience declines as the technology matures, and system-based trust takes precedence. In Figure 2, we have also highlighted recursive dynamics, showing how each orchestration phase reinforces cognitive and relational capital. Recursive dynamics support effective blockchain implementation and innovation. Our findings suggest that organizations should implement training programs to help stakeholders shift from interpersonal to system-based trust. It will help them to gain the necessary skills and understanding needed to operate confidently within blockchain ecosystems. Capability building and investment in scalable and interoperable systems are vital for seamless integration, long-term efficiency, and strategic adaptability. Organizations also need to develop an adaptive culture to support automation and transparency. This will help them leverage blockchain's decentralized logic to support sustainable and resilient supply chains. Figure 2 serves not only as a theoretical abstraction but also as a practical roadmap for managing the temporal, relational, and technological complexities of blockchain implementation.

While most of our findings reinforce the enabling role of relational and cognitive social capital in resource orchestration, some exceptions reveal critical boundary conditions. As outlined in section 4, in certain instances, high trust and shared understanding did not lead to effective coordination due to the supplier being constrained by outdated IT infrastructure and/or insufficiency in resourcing. This underscores the dependence of resource orchestration not only on inter-organizational alignment but also on an organization's ability to reconfigure and deploy its internal resources effectively (Sirmon et al., 2011). Additionally, the cases where the supplier(s) complied with blockchain implementation without very high relational capital supported the need for formal governance structures in such supply chain settings (Kouhizadeh et al., 2021). However, given this was evident in only a few minor cases we explored, we argue that there is a need for a balanced state of relational trust alongside proper governance mechanisms for an inter-organizational technology implementation (blockchain in our case).

6. Contributions and Implications

In this section, we have discussed both the theoretical and managerial implications based on the findings of our study.

6.1 Implications for Research

This study makes various novel contributions to theory-building within the domains of digital transformation and global supply chain management. First, it employs an amalgamation of Resource Orchestration Theory (Sirmon et al., 2011) and Social Capital Theory (Nahapiet & Ghoshal, 1998). This novel integrative lens captures both the structural and dynamic nature of blockchain implementation. Usually, Resource Orchestration Theory is focused on intra-organizational resource deployment. However, this research uncovers its application in inter-organizational orchestration, where a focal firm strategically nurtures its suppliers' absorptive capacities and digital readiness. This contributes to recent scholarly work on repositioning orchestration as a networked capability (Wieland, 2021; Roehrich et al., 2023). It is even more critical in the settings of fragmented and globalized supply chains. Second, the study reframes

blockchain implementation as a cyclical and recursive process. It challenges the prevailing deterministic or stage-based models found in the extant literature (Saberi et al., 2019). Our findings illustrate that cognitive and relational capital not only enable early engagement and coordination but also evolve due to blockchain use. For example, shared ledgers and smart contracts improved transparency and reduced opportunism, thereby reinforcing inter-organizational trust. This feedback loop challenges the "trust-then-integrate" viewpoint by unravelling a cyclical relationship. Here, social capital is both an enabler and an outcome of digital transformation. This shift aligns with emergent perspectives in digital transformation that recognize the co-evolution of capabilities, trust structures, and learning as an ongoing rather than sequential process (Gillani et al., 2024). Therefore, this research introduces a temporal dynamic of trust transformation between institutional and relational trust. It acts as a central mechanism that enables or impedes blockchain implementation. This temporal framing extends Social Capital Theory, which often treats trust as static, by revealing how blockchain technologies themselves can reshape the contours of inter-organizational trust and legitimacy (Pattanayak et al., 2024). Third, the findings unpack differential patterns of resource orchestration and social capital mobilization across suppliers, depending on their embeddedness and digital maturity. This heterogeneity highlights the significance of investigating both Resource Orchestration Theory and Social Capital Theory at a more granular level. It is in alignment with recent studies that underscore moving beyond aggregate-level theorizing to reveal nuanced intra-network dynamics (Zhou et al., 2024; Yan et al., 2024). The insight that social capital can act as both a facilitator and constraint, based on whether it supports or resists digital learning, challenges the traditional view of social capital as universally beneficial. Fourth, our multi-case study in food supply chains highlights that blockchain success relies on navigating relational asymmetries and digital maturity gaps. We introduce the concept of inter-organizational digital readiness orchestration. It offers a theoretical and practical link between Resource Orchestration Theory and Social Capital Theory for supply chain contexts. Further, this study contributes to the underexplored phenomenon of blockchain deployment in emerging and developing economies, where institutional voids raise the salience of trust and informal mechanisms (Zhu et al., 2022). It responds to calls for context-sensitive theorizing that accounts for power asymmetries, informal institutions, and capability disparities in global supply chains (Islam et al., 2023). By grounding its findings in global supply chains, this study offers a more nuanced account of how blockchain technologies are seized, challenged, and reframed in real-world inter-organizational settings. Collectively, these contributions outline a procedural, co-evolutionary model of blockchain-enabled transformation. It advances theory on trust, orchestration, and digitally mediated collaboration. It lays a strong foundation for future research to investigate longitudinal, multi-level, and cross-cultural dynamics of blockchain orchestration. Therefore, it enriches the theoretical paradigm at the intersection of strategic management, information systems, and supply chain studies.

6.2 Managerial Implications

This study offers several key strategic implications for practitioners engaged in blockchain-enabled supply chains. First, it underscores that successful blockchain implementation is not mere technological sophistication. However, it is about orchestrating complementary relational and knowledge-based assets. Managers should perceive blockchain as an ecosystem intervention, which is driven by cross-organizational trust, interpretive alignment, and joint decision-making. In the early stages, accumulating relational and cognitive social capital is essential. This includes organizing trust-developing workshop sessions, co-developing data

standards, and finalizing blockchain objectives via collaborative onboarding sessions. As our case evidence demonstrated, efforts to align data practices and develop mutual understanding reduced integration resistance and thereby improved project coordination. Notably, managers should plan for a transition in trust forms, from interpersonal trust (based on prior relationships) to system-based trust (enabled by blockchain's verification, transparency, and automation). This shift calls for stakeholder awareness on blockchain's "trust-by-data" paradigm and the deliberate use of smart contracts and dashboards to make processes auditable and reliable. Managers need to act as community builders in the initial stages and technology champions as implementation matures. It will ensure that trust is not lost but transferred into digital systems. Second, focal organizations need to assume an active leadership role in developing their suppliers' absorptive capacity. This extends beyond technical training to incorporate embedded, trust-based collaborations, for example, pilot projects and co-investment in digital infrastructure. Further, suppliers with low relational embeddedness or weaker trust ties may require different orchestration strategies. This highlights the need for trust mapping and segmentation.

Finally, our research uncovers that blockchain orchestration is highly contingent. In highly regulated sectors like food, compliance, instead of efficiency, is usually the primary integration driver. Managers should design blockchain architectures that adhere to traceability and auditability requirements from the beginning, aligning with standards and certification requirements. In global supply chains with digitally asymmetric partners, focal organizations need to assume capability-building roles. This might involve organizing IT literacy workshops, user-friendly interfaces for low-tech partners, or infrastructure joint investment. Tools such as trust mapping and digital readiness assessments can assist in tailoring orchestration strategies. Policymakers and industrial practitioners also play a critical role. Managers should advocate for support programs (such as subsidies, technical guidance), which lower entry barriers for SMEs. Such inclusive orchestration will result in more resilient and comprehensive blockchain ecosystems.

Although our research offers the above theoretical and practical insights, it is important to recognize its contextual boundaries. The empirical data were derived exclusively from the UK food sector, a context characterized by high regulatory intensity (e.g., traceability requirements), perishability of goods, strong compliance-oriented cultural norms, digital readiness of suppliers, availability of financial and human resources, power asymmetries between buyers and suppliers, and a relatively concentrated supply chain structure. These sector-specific characteristics may raise the importance of relational and cognitive capital in facilitating resource orchestration. It is more pronounced under conditions of strict traceability and interdependence. Translating the findings of these studies to other contexts, for instance, decentralized and poorly regulated industries, requires critical investigation. Future research should build upon the framework of this study and test its efficacy in various cultural, institutional, sectoral, and structural specifications.

7. Conclusion

This research develops a framework for blockchain implementation using an abductive approach, examining how different levels of social capital influence resource orchestration. The key contribution is the proposed framework (Figure 2), which reveals the interplay between social capital and resource orchestration in enabling effective blockchain

implementation within supply chains. Unlike prior studies that mainly emphasize blockchain's operational and security aspects, our findings uncover a cyclical interaction between cognitive and relational social capital during implementation. We reconceptualize the buyer–supplier relationship by showing how trust, shared norms, and collaboration act as critical enablers of blockchain success. While structural capital is foundational, advanced relational and cognitive capital are essential for sustained implementation. Our findings challenge the traditional linear view, showing instead a cyclical relationship: relational capital is vital in early stages, but its role reduces as automation, smart contracts, and system-based trust increase. In addition to theoretical insights, we offer practical implications. Blockchain implementation should be seen as both a technological and relational transformation. Managers should prioritize trust-building through joint training, knowledge sharing, and collaborative governance, enhancing readiness and alignment among stakeholders in global supply chains.

7.1 Limitations and future research

This study integrates Social Capital Theory and Resource Orchestration Theory to explain blockchain implementation; it does not fully incorporate other relevant theoretical perspectives such as Dynamic Capabilities and Institutional Theory. These alternative lenses may offer complementary or even competing explanations, particularly in understanding how firms adapt to technological change over time or how institutional pressures shape inter-organizational collaboration. Future research could build on our framework by incorporating these perspectives to provide a more holistic and multi-level understanding of blockchain adoption processes in diverse supply chain contexts. Second, the empirical evidence is derived from a qualitative case study consisting of a single buyer and its network of suppliers. Although this approach enabled in-depth exploration of context-specific dynamics, the findings may be subject to limitations in generalizability. Further research could enhance external validity via methodological triangulation. Large-scale surveys, experimental designs, and/or archival data can provide robustness of the identified relationships, particularly the cyclic interplay between trust and resource orchestration. Third, this study focuses on the UK food sector, which is highly regulated, compliance-oriented, and has a concentrated supply chain. These characteristics may have amplified the importance of social capital in resource orchestration, particularly due to the sector's strong focus on traceability and collaboration. Therefore, applying these findings to other sectors or regions, especially those that are decentralized or less regulated, requires caution. Future research should test the framework across varied institutional, cultural, and structural settings to better understand its generalizability and limitations.

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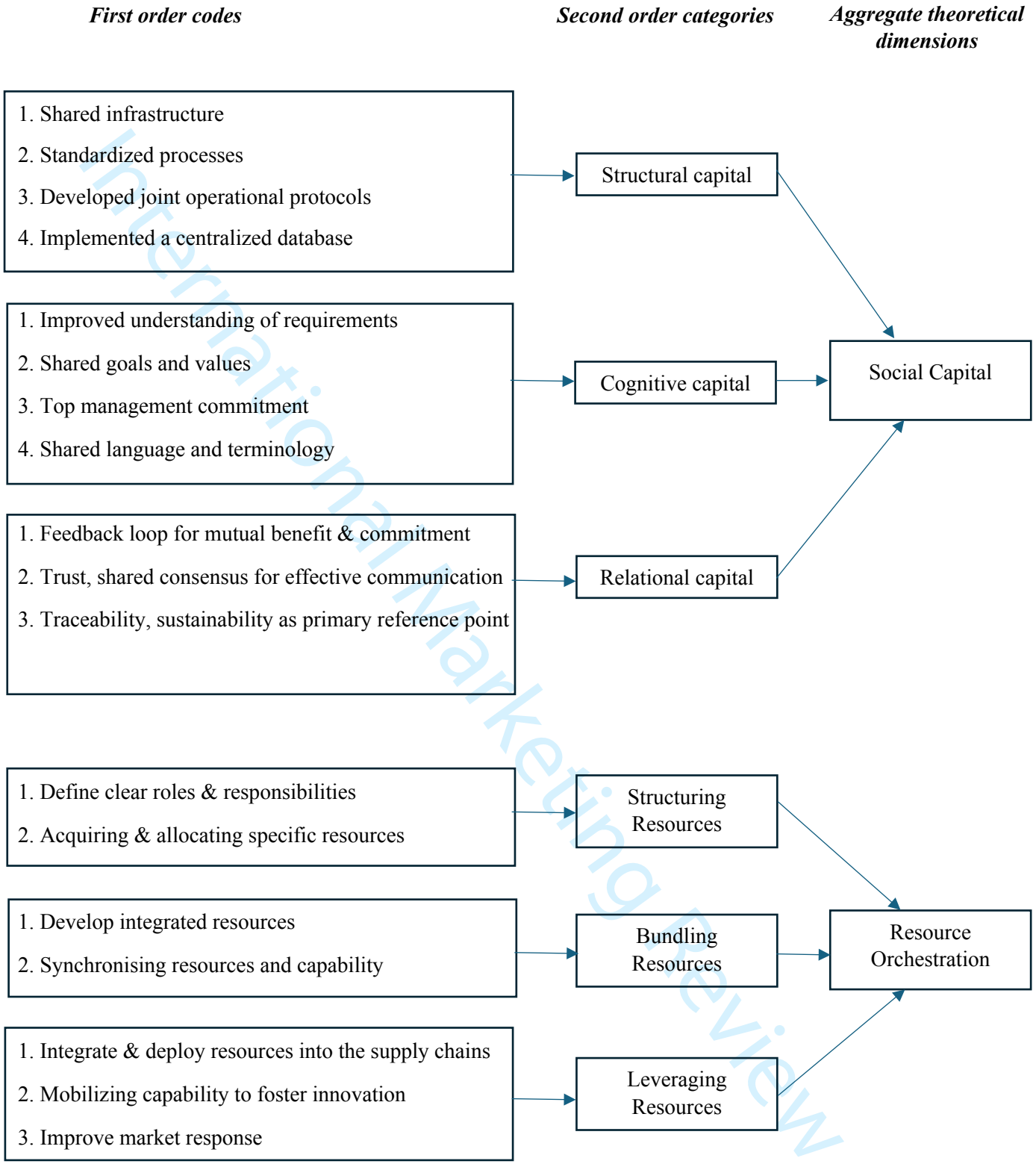

Figure 1 Data Structure

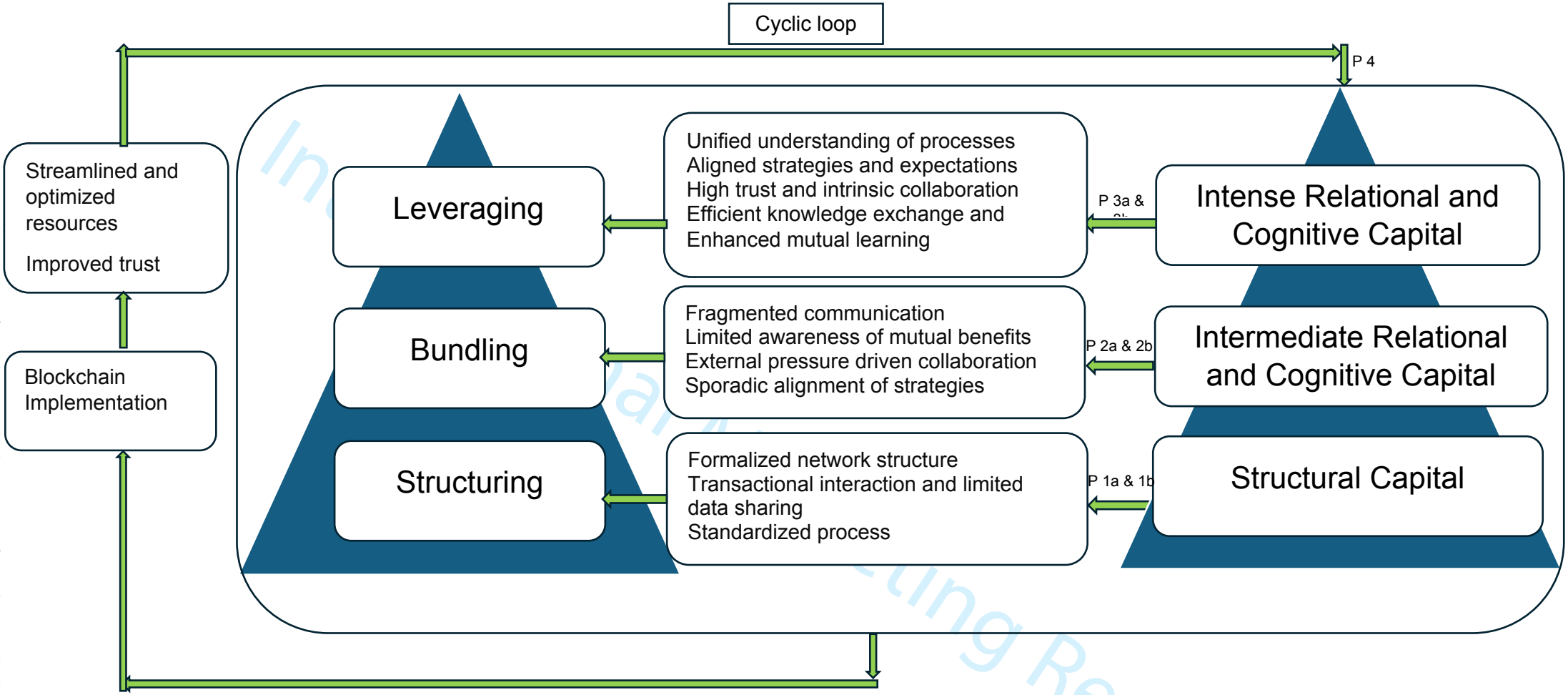

Figure 2 Conceptual framework theorizing the impact of social capital on resource orchestration

Table 1. Literature-Based Guidelines for Ensuring Research Rigor

Rigor criteria	**Procedures to rigor criteria in this study**		
	Design	**Data collection**	**Data analysis**
Construct validity *(suitable measures for the concepts being studied)*	- Interview questions derived from previous research on blockchain adoption, social capital, and resource orchestration theory.	- Used multiple sources of data (interview data and secondary data) - Maintained close dialogue with experts - Conducted a pre-test of the interview protocol via expert review and feedback from academics.	- Triangulation of data collected from different sources - The abductive method was adopted to analyze different themes emerging from the data - Developed systematic procedures for data coding and analysis and validated interview transcripts to mitigate researcher bias
Internal validity *(causal relationships between variables and results)*	-Developed a framework based on well-established social capital, resource orchestration, and blockchain adoption literature.	-Interviewed different company experts to capture the knowledge. -Carefully transcribed interviews verbatim and obtained feedback from respondents.	- Recorded alternative explanations -Triangulated multiple theories for interpretation - Reviewed data multiple times and literature to avoid bias.
External validity *(generalisation of findings)*	-Selected organizations and their suppliers in different stages of blockchain implementation and at different levels of social capital to maintain heterogeneity.	-Provided a comprehensive disclosure of sampling protocol -Provided a detailed description of the physical, social/experimental environment pertaining to the research setting.	-Pattern matching for analytical generalization (matching the resulting themes that emerged from employing social capital, resource orchestration for blockchain adoption, to those discussed in the literature)
Reliability *(replicability of the research design and result)*	- Developed a reliable and transparent interview protocol	-Developed a comprehensive database to capture a reliable portfolio of evidence, including primary data (transcripts) as well as secondary data.	- Utilized NVivo 14 for data analysis and maintained a record of coding decisions and annotations. - Thorough scrutiny of interim results amongst researchers.

Table 2. Interviewee Profiles

Sl no	Type of Organizations	Job Profile	Number of Years of Experience	Interviewee	Duration of Interview
1	Focal Firm	Procurement Manager	20+	FA	65 min
2		Supply Chain Manager	30+	FB	75 min
3		Head of Quality Control	25+	FC	60 min
4	Supplier 1	Owner	20+	SAA	63 min
5		Production Manager	10+	SAB	58 min
6		Supply Chain Manager	12+	SAC	64 min
7	Supplier 2	Owner	22+	SBA	60 min
8		Production Manager	13+	SBB	59 min
9		Supply Chain Manager	15+	SBC	50 min
10	Supplier 3	Owner	18+	SCA	52 min
11		Production Manager	16+	SCB	49 min
12		Supply Chain Manager	10+	SCC	68 min
13	Supplier 4	Owner	12+	SDA	56 min
14		Production Manager	10+	SDB	52 min
15		Supply Chain Manager	17+	SDC	63 min
16	Supplier 5	Director	19+	SEA	51 min
17		Production Manager	14+	SEB	58 min
18		Supply Chain Manager	12+	SEC	60 min
19	Supplier 6	CEO	11+	SFA	48 min
20		Production Manager	18+	SFB	52 min
21		Supply Chain Manager	16+	SFC	66 min
22	Supplier 7	Owner	15+	SGA	50 min
23		Production Manager	12+	SGB	61 min
24		Supply Chain Manager	19+	SGC	68 min
25	Supplier 8	Managing Director	16+	SHA	53 min
26		Production Manager	18+	SHB	58 min
27		Supply Chain Manager	21+	SHC	60 min
28	Supplier 9	Managing Director	14+	SIA	50 min
29		Production Manager	20+	SIB	64 min
30		Supply Chain Manager	13+	SIC	55 min

Table 3. Interview Protocol

Section	Questions
Introduction	- Please provide a brief overview of your company and your responsibilities within the company
Social Capital	- Could you describe how communication and collaboration have evolved since the introduction of blockchain technology in your supply chain? - In your experience, how has the implementation of blockchain impacted the level of trust and rapport between your business partners? - From your perspective, what measures or initiatives have been most effective in fostering a strong partnership with your buyer during the blockchain implementation process? - How do you ensure that both parties are aligned in terms of goals, expectations, and support for integrating blockchain into your supply chain?
Resource Orchestration	- Can you describe the current stage of your blockchain implementation and how it fits into your overall business goal, shared value, and supply chain operations? - What specific areas of your business operations are currently benefiting from blockchain technology, and which areas are you looking to expand into, and how will you utilize resources to achieve that goal? - What have been the primary goals of implementing blockchain in your business, and to what extent have these goals been achieved so far? - How does the blockchain help you in effective decision-making, problem-solving, and value creation to enhance your competitive advantage?

Table 4. Theme, Categories, and Representative Quotes

Second-order themes	First-order categories	Representative quotes
Structural capital	Shared infrastructure	*"It's crucial that we move beyond just setting up blockchain resources […] It's like having all the ingredients for meal prep but not actually preparing the meals [...] In the beginning, we realized that a lot of the systems we were using to track inventory were different. It was a bit of a mess trying to keep things in sync, especially when you're dealing with perishable goods. So, we agreed to use a shared digital system for tracking stock and deliveries, and this has helped a lot. By having a common infrastructure, both sides can monitor in real-time where the product is […]"(Interview SGA)* *"[…] both of us now log our deliveries and inventories on the same platform. This has cut down on miscommunications and errors. We're both able to see where the shipments are and what condition they're in, which builds trust […]"(Interview SCC)* *"[…] We've moved from using separate systems to a shared platform where we both track orders, deliveries, and quality checks. This common infrastructure not only speeds up communication but also makes future integration […]"(Interview SEC)* *"[…] We've moved to a shared platform with our buyer […] This shared system has reduced delays and errors, making it much easier to pinpoint where blockchain […]"(Interview SCC)*
	Standardized processes	*"In the food industry […] to make our partnership work better, we agreed on a set of common practices, like standardizing how we document product batches and the quality checks. This kind of alignment has helped us become more flexible in adapting new tech […]" (Interview SGB)* *"Initially, we had different ways of tracking and reporting on our products […] we've standardized everything, from how we track produce from farm to table to how we verify quality at each step…it*

		ensures we're speaking the same language, making it easier to introduce new technologies […]"(Interview SHA)
	Developed joint operational protocols	*" […] It's not just about getting food products from A to B; it's making sure our systems talk to each other. For instance, we've developed a protocol where both teams check and record the temperatures of products at every step. We're gradually automating that process, and blockchain could be the next step to fully integrate and secure all that data." (Interview SHB)* *"We spent a lot of time developing a consistent set of protocols with our buyer. For example, when a shipment arrives, our team and their team log the same data points, weight, condition [...] By having these protocols in place, it's easier to ensure transparency […]."(Interview SDA)* *"In procurement, we've worked closely with our buyer to develop joint protocols, especially for handling fresh produce. Whether it's temperature controls during transportation or the timing of deliveries, both sides are aligned on how to manage these processes. This is key because, without that operational consistency, trying to bring in blockchain wouldn't be as effective. These joint protocols are paving the way for that next step." (Interview SBC)* *"In the food industry, timing and coordination are everything. We've worked closely with our buyer to develop joint protocols around delivery schedules and handling procedures […]"(Interview SAA)* *"We've established a shared infrastructure with our buyer to support blockchain implementation […] It's about laying the groundwork […] We've standardized our processes with our buyer to facilitate blockchain implementation. This involves harmonizing protocols for data entry and verification across our supply chain network […] We've established governance structures and communication protocols to drive mutual accountability and innovation. This collaborative spirit underpins our journey towards supply chain excellence." (Interview SCA)*
	Implemented a centralized database	*"One of the big improvements we made was moving towards an integrated platform where we both log all the key information on food shipments. Things like expiry dates, storage conditions, and delivery times are all in one place now […]"(Interview SAC)*

		"A few years ago, each of us was managing our own data, and it was tough to keep track of everything. Now, we've shifted to using an integrated platform where both the supplier and buyer can access key information, from batch numbers to quality checks […]"(Interview SDC) *"We decided to integrate all our data in one system where both we and our buyer can track everything from product origin to delivery status. It's been a game changer in terms of reducing manual tracking and miscommunication […]"(Interview SAB)*
Cognitive capital	Improved understanding of requirements	*"You know, when we started working with the buyer, we had some initial misunderstandings about what exactly they wanted in terms of traceability for the blockchain system. But over time, and through regular back-and-forth, we've come to a place where we're much clearer on what they need from us to make blockchain work [...]"(Interview SAB)* *"At first, there was a lot of confusion about what exactly was needed for blockchain integration, especially around what data needed to be tracked at each stage. But through ongoing discussions, we've gotten a clearer picture. We're still fine-tuning things, but having that better understanding from both sides has helped us move forward more confidently." (Interview SIA)* *"[…] After several workshops and clarifying sessions, we're understanding exactly what's required to make the system work smoothly […] we understand each other well […] We pulled together the right people and resources, and got things done " (Interview SAC)* *"At first, we didn't fully grasp all the specifics of the buyer's requirements for blockchain integration [...] It's been a learning curve, but now we've established a clearer roadmap for how we can meet their requirements." (Interview SAA)*

	Shared goals and values	*"Both of us, the buyer and we, agree that food safety and traceability are critical. We're having a shared vision about the end goal, like making sure every part of our supply chain is visible and compliant, really helps us push forward with what we're doing." (Interview SHC)* *"We both care about ensuring that our products meet the highest quality and ethical standards, especially with consumers increasingly demanding transparency. We might not have nailed down all the blockchain elements yet, but because we share that broader vision, we're working through the technical challenges together, knowing that we're aiming for the same thing." (Interview SHA)* *"One thing that keeps us going is the fact that we both want to achieve the same thing—end-to-end traceability for food safety. Even when we hit roadblocks, knowing that we share this bigger objective keeps us aligned. It's not just a transactional partnership; we're both committed to making sure we get this right for the long term. Knowledge exchange with our buyer has been enriching […]. This collaborative learning informs our strategy to integrate blockchain […]" (Interview SIB)* *"We believe that by working together […] blockchain technology allows us to bring transparency and trust into every step of the journey […] ensuring that the food you receive is not only safe and healthy[…] (Interview SBC)* *"In all the meetings with our buyer, we realized the need for stronger partnerships and open lines of communication. We felt that only sharing the data, we have seen some improvements. However, our IT person and supply chain person continuously emphasize on integrating data and working together with the buyer to get the best out of the blockchain […] meeting the highest standards of quality and sustainability." (Interview SBB)* *"Our teams have been in and out of workshops and training sessions together […] It's like we're in this big learning adventure together, and it's brought us closer. (SFB)* *"When we first started talking about blockchain with our buyer, it was clear we both saw the massive potential it had for our supply chain […] with our team's expertise and the support of our buyer […] It*

		wasn't always easy, but we had the right people in place to make it work […we both genuinely believe this will help us deliver better, safer products to our customers […]" (Interview SFA)
	Top management commitment	*"Our senior leadership sees blockchain as a long-term investment. I wouldn't say they're fully hands-on every day, but they back us up. That commitment from the top definitely helps when we need resources or need to adjust our processes […]"(Interview SHC)* *"Our top management is pretty clear that blockchain is the future, especially for food traceability. Their backing gives us the room to experiment and make mistakes as we learn how best to implement this with the buyer." (Interview SGC)* *Our leadership has been supportive from the start. They've made sure we have the resources and time to make this work. That kind of backing from the top allows us to focus on what needs to be done without cutting corners." (Interview SEA)*
	Shared language and terminology	*"One of the challenges we had was aligning on the tech language. When you talk about blockchain, especially with technical teams, it's easy to get lost in jargon. We've made it a point to clarify what we mean by things like 'traceability' and 'audit trails' so that both sides, us and the buyer, are on the same page and not talking past each other." (Interview SEA)* *"Early on, we had a lot of back-and-forth over technical terms, what we meant by 'full visibility' versus what the buyer expected. We've spent time clarifying that language so that when we say something like 'traceability,' it means the same thing on both sides […]"(Interview SHB)* *" […] Things like 'immutability' and 'distributed ledger' were not always understood the same way by both sides. We've spent time making sure everyone knows what these technical terms mean in practice, which has made collaboration smoother." (Interview SIA)*
Relational Capital	Feedback loop for mutual benefit & commitment	*"We've set up these bi-monthly check-ins with the buyer, where we share progress on how the blockchain system is coming along and get their feedback on how we're doing […]" (Interview SGA)*

		"We've set up regular checkpoints with the buyer [...] This feedback loop is helping both of us adjust in real-time, instead of waiting until something becomes a bigger issue down the line." (Interview SIC) *"[...] We regularly provide updates and get feedback from the buyer. It's a continuous process of improvement. Sometimes they point out areas where we can do better, and other times we share insights from our side." (Interview SHB)* *"[...] We spent a lot of time making sure our data formats matched up and our systems [...] We regularly feed back and forward[...] These meetings are a chance to get real-time feedback, which helps us fine-tune things as we go. It's a collaborative effort, and being able to adjust quickly based on their input has been key." (Interview SBC)*
	Trust, shared consensus for effective communication.	*"We've built a decent level of trust with our buyer, especially around how we communicate updates and issues with blockchain. They know if we hit a snag, we'll bring it to them right away. That trust means we can make quicker decisions and keep things moving forward without second-guessing each other's intentions." (Interview SFA)* *"Trust is fundamental in our supplier-buyer relationship, especially when implementing new technologies like blockchain. We're gradually building confidence in each other's capabilities [...] This trust is pivotal as we collaborate on improving our supply chain resilience [...] If something isn't working on our side, we're upfront about it. They appreciate that, and it means they're more willing to give us space to fix things without micromanaging. It helps keep the relationship positive and focused on solutions." (Interview SAB)* *"There's a level of trust now where both sides know we're in this for the long haul. We don't hide problems when they come up, we address them together. That's built a sense of mutual respect and understanding, which makes working through challenges like blockchain integration a lot easier." (Interview SBA)* *"The trust we've developed with some suppliers has made all the difference. When issues arise, we don't escalate [...] we collaborate. It's helped us transition from reactive troubleshooting to proactive joint problem solving [...]" (Interview FA)*

		"We're not hiding problems, and they're not either. That openness has been key in ensuring that we both stay committed to making blockchain integration successful. [...] We're no longer chasing calls or double-checking details, it's all tracked and verified automatically. Instead of worrying about trust, we're focused on connecting our system with other buyers to keep things running smoothly [...] " (Interview SHA) *"Over the years, we've come to realize that our strongest partnerships have led to the best results for collecting relevant data related to food quality, sustainability, ethical standards[...] When we have close, open relationships with our suppliers, everything just clicks into place more smoothly [...] It's like having a clear window into every part of the supply chain, from the farmers harvesting crops to the products reaching our shelves [...] more we invest in these trusted relationships, the easier it is to solve challenges, trace the journey of our food, and ensure that what we offer is safe, fresh, and responsibly sourced [...]using this information helped us differentiate our product from our competitor. " (Interview SIC)* *"[...] The level of trust we've built is incredible [...] We see the same data, so there's complete transparency. It's really reinforced our confidence in each other [...] (Interview SHC)* *[...] blockchain is like a superglue for those relationships with our buyers [...] what's great about it is that we don't need everything to be perfectly aligned from the get-go. We started small, rolled out simple features, and still made progress. Using this system, everyone can clearly see what's happening, whether it's tracking shipments or ensuring quality standards[...]" (Interview SAC)* *"[...] Using blockchain, we've managed to share resources more smoothly, which has really helped us in finding new ways to grow and improve our operations." (Interview SHB)* *"When we first introduced blockchain, trust was a big deal. Take strawberries, for example—if the temperature during transport wasn't monitored properly, it could ruin the whole shipment. [...] Now, with blockchain, the system handles that for us. Smart contracts automatically trigger payments as long*

		as the temperature stays within range, and everyone can see the journey from farm to delivery […]" (Interview SBB)
	Traceability, sustainability as primary reference point	*"One thing we both focus on is making sure that our blockchain system helps meet those sustainability goals. Ethical sourcing is a big one for us, and it's something the buyer cares about, too. Every time we're discussing a new feature or update, we always circle back to how this will improve traceability and meet our sustainability standards." (Interview SAB)* *"[…] We both believe that better traceability can help ensure we're meeting our ethical sourcing commitments. So, whenever we hit a roadblock, we remind ourselves of that shared goal. It keeps the conversations productive and future-focused." (Interview SAA)* *" Before blockchain, tracking our ingredients was like trying to find a needle in a haystack. Now, every ingredient, from the farm to our factory, […] As we delve into blockchain with our buyer, we're uncovering how it can optimize traceability and ensure compliance throughout our production processes […] Both of us are keen on improving the traceability of our products, not just for operational reasons but because consumers are demanding more transparency on where their food comes from. Sustainability is a big focus, and the blockchain helps us document and verify that we're meeting those ethical standards, which is a win-win for both parties." (Interview SHA)* *"With blockchain, […] let's say we have a batch of organic avocados. From the moment they are picked at the farm, every step of their journey is recorded on the blockchain […] If there's ever an issue, like a quality concern or a recall, we can trace it back to the exact farm and even the specific batch they came from [...] For us, it's about showing that we can trace our products from the source and prove their ethical origins. The buyer is just as focused on this, and it's one of the reasons why we're pushing hard to get blockchain right—it aligns with both our long-term values." (Interview SBA)* *"[...]blockchain helps us track the energy used in production to the transportation emissions, all data is logged on it […] This kind of transparency is not just about safety—it's about building trust with our customers who care deeply about where their food comes from." (Interview SBB)*

Structuring Resources	Define clear roles & responsibilities	*"[…] We've made it a point to clearly define who does what. For instance, my team handles everything from packaging to dispatch, while our buyer's team is responsible for tracking delivery once the goods leave our facility. This clear division has really helped us focus on where blockchain could fit into the process, but it's all about having that structured setup first […]" (Interview SCA)* *"[...]We need to start deploying these resources to improve the traceability and quality control [...]" (Interview SFB)* *" In our new process, now the warehouse team is responsible for preparing the product and getting it to the warehouse, and the focal firm manager manages from there. It helps us to reduce confusion and focus on value and verify shipments […]" (Interview SDB)* *"In procurement…. My team manages sourcing, while our buyer's team focuses on logistics. […] that clarity has allowed us to be more strategic about where we allocate resources […]" (Interview SGC)*
	Acquiring & allocating specific resources	*"We've had to invest in specific tools and technology to streamline our food tracking, like temperature monitors and GPS tracking systems for our trucks. These resources are critical because they allow us to meet our buyers' standards […]"(Interview SEA)* *"We've made some targeted investments in technology and tools that help us monitor and control the quality of our food products. For example, we've installed temperature sensors in our transport vehicles, which gives us real-time data on the conditions our food is traveling in […]" (Interview SCC)* *"[…] we can monitor everything from soil conditions to the final product delivery. Allocating these resources now makes it easier for us to adapt to blockchain later on because we'll already have the necessary data and systems in place to support it." (Interview SGA)*

Bundling Resources	Develop integrated resources	*"We've been working closely with our internal teams to pull together data from different systems, inventory, quality control, logistics, and integrate that with the blockchain platform. It's been a bit of a challenge, but the more we can align those resources, the better equipped we are to offer full traceability from farm to table." (Interview SIA)* *"[…] It's been a bit of a learning curve, but this integration is essential if we want to make sure that every piece of data can flow seamlessly from our end to the buyer's platform." (Interview SHA)* *"Internally, we've been working to integrate different systems—our supply chain management software, our quality assurance processes, and now blockchain. It's not just about adding blockchain on top of what we're already doing but making sure everything works together to give us a comprehensive view of our operations." (Interview SAA)* *"We've had to break down some of the silos within our company to integrate the blockchain system with our existing processes. It's been a challenge, but we're now getting our inventory management, quality checks, and logistics all feeding into the same platform. This kind of integration is what's going to help us meet the buyer's blockchain requirements more efficiently." (Interview SAC)* *We've had to bring together a lot of different resources—IT, supply chain, quality control—and make sure they all work together […] We're getting better at coordinating these resources, and it's starting to show in how smoothly things are running." (Interview SIC)* *"[…] blockchain to track where our ingredients come from and to make sure everything is safe to eat, and it's already making a difference. Our buyers have told us they want more transparency they'd like to see exactly where our fruits and vegetables are grown, which farms they come from, and how they're handled before they reach their shelves. Blockchain can help us show all that clearly […] (Interview SIB)*

	Synchronizing resources and capability	*"What we're doing now is synchronizing our logistics team with the blockchain experts. Before, these teams worked pretty separately, but now they're starting to collaborate. That's been crucial in making sure the information flow on our end can match the expectations of the blockchain platform the buyer is pushing for." (Interview SIC)* *"It's really about getting everyone on the same page. We've had to synchronize our teams, like the ones handling raw materials and the IT folks. Before, they worked in silos, but now we're getting them to collaborate more closely. That way, when something needs to be tracked via blockchain, both the technical and operational sides are in sync and ready to deliver." (Interview SHB)* *"We've had to make sure that different teams within our company are aligned, from procurement to IT. Synchronizing their efforts means that we can gather the right data at the right time and feed it into the blockchain system. It's a work in progress, but when all the pieces come together, it's going to help us ensure complete transparency." (Interview SHA)* *"For us, successful blockchain implementation depends on how well our suppliers can align their systems with ours [...] We've seen that shared dashboards and synchronized inventory planning have significantly reduced mismatches [...]" (Interview FB)* *"It feels like a start, but we can work even more closely with our buyers and suppliers, not just to track their shipments but also share data of our supply chain like quality problems,[...] to avoid issues such as spoilage or delays before they even happen, which saves us money and helps deliver fresher products to our customers [...] we can be in a better position to grow our business and stand out in the market." (Interview SAC)*
Leveraging resources	Integrate & deploy resources into the supply chains	*"We've made sure to deploy resources effectively, especially in terms of integrating blockchain into our existing food traceability systems [...] It's been a learning curve, but the resource integration has paid off." (Interview SFA)* *"From a resource perspective, we had to rethink how we were allocating our internal teams when it came to blockchain. [...] it's about aligning resources to make sure everything fits smoothly into our*

		existing supply chain. We've been able to align these resources effectively, and now our traceability data flows seamlessly from farm to retailer." (Interview SBC) *"It wasn't just about adding another system; we had to make sure our entire team, from logistics to IT, was aligned and trained. We also invested in the right technology to make sure that our blockchain system could handle the volume of data we're tracking, especially when it comes to things like temperature control for perishable goods […]"(Interview SBA)*
	Mobilizing capability to foster innovation	*"What's exciting is that by integrating blockchain, we're not just tracking products; we're using the data to innovate. For instance, we're now exploring how we can use this transparency to offer premium, ethically sourced products that consumers can verify themselves […] We can also store data on sustainability, for example, our chocolate products are sourced from farms committed to fair trade and sustainable farming. Blockchain allows us to document and verify these practices […]to ensure that our operations are environmentally friendly […] " (Interview SBB)* *"Now that we have real-time data on everything from production methods to shipping conditions, we've been able to use that information to offer new products that cater to the growing demand for ethical and sustainable food. We've even started working with the buyer to create premium product lines that can prove their ethical sourcing via blockchain data […]" (Interview SFC)* *"As suppliers start leveraging blockchain data for traceability, it opens doors for us to co-create new product lines that meet regulatory and consumer expectations around sustainability [...]" (Interview FC)* *"[…] Because all our data is recorded in an immutable ledger, it's easy to provide the necessary documentation during audits. For instance, when we were recently audited for food safety compliance, we could quickly pull up detailed records for each batch of our canned goods, showing everything from raw material sourcing to final distribution […]" (Interview SBA)*

	Improve market response	*"Once the shipment arrives and passes our quality checks, a smart contract automatically triggers the payment to the supplier […] It also builds trust with our supplier […]. We now have a real-time view of stock levels across […] if we need to track the stock of our packaged nuts, blockchain gives us up-to-the-minute data […]. This level of detail helps us avoid both overstocking and stockouts […] Since we've implemented blockchain, we've been able to respond faster to market demands for more transparent and traceable food products. The data we collect has helped us tweak our offerings in real time, giving us an edge in the market. Customers are asking more and more for proof of origin, and now we can give that information instantly […]"(Interview SBA)* *"By tracking every step of our whole supply chain, now we ensure that all our activities are environment friendly […] This helps us achieve sustainable and ethical practices required by our buyer as well as responding to our CSR […]It helps our product stand out more in the market." (Interview SIC)* *"[…] we've become much more responsive to changes in the market. We can now provide retailers with real-time updates on the status of their orders, including detailed information about product origin and handling. […] transparency has allowed us to quickly adjust to shifting consumer preferences, like the increasing demand for locally sourced, sustainable products. Being able to respond quickly to market changes has given us a competitive advantage, especially in an industry where consumer preferences can change overnight […]"(Interview SFA)* *We're now able to offer detailed traceability data to our customers, which is something they're increasingly asking for, especially when it comes to organic and ethically sourced products. This real-time information has helped us stay ahead of the curve […]" (Interview SFB)*