

Relational Governance and Supply Chain Collaboration among Food Manufacturing SMEs: Evidence from a Qualitative Multiple Case Study in Indonesia

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ABSTRACT: Supply chain collaboration is increasingly important for food manufacturing SMEs facing fluctuating demand, volatile prices, and frequent supply disruptions. This study explores how food manufacturing SMEs in Malang, Indonesia, collaborate with suppliers and distributors, identifies factors facilitating and hindering collaboration, and examines mechanisms sustaining long-term collaborative relationships. A qualitative multiple case study design was used between June and August 2024. Data were collected through semi-structured interviews with thirteen purposively selected informants, including SME owners, managers, purchasing and logistics officers, suppliers, and distributors. Transcripts were analyzed using thematic analysis, involving coding, category development, within-case analysis, and cross-case comparison. Credibility was strengthened through triangulation and member checking. Findings show collaboration is characterized by regular communication, information sharing, production planning, and supplier flexibility. Trust emerged as the main governance mechanism supporting flexible payments, supplier prioritization, and reciprocal problem-solving. Information on demand, inventory, and delivery schedules was mainly exchanged via WhatsApp and shared spreadsheets. Although collaboration improved coordination, SMEs still faced challenges from price volatility, demand uncertainty, and supplier capacity constraints. Digital tools enhanced collaboration only when embedded in trust-based relationships with timely information sharing. Long-term relationships were sustained through payment reliability, consistent quality, and mutual support. The study concludes that collaboration among Indonesian food manufacturing SMEs is predominantly relationship-based rather than contract-driven, with relational governance and digital tools strengthening resilience under uncertainty.

Keywords: Supply Chain Collaboration, Food Manufacturing SMES, Relational Governance, Information Sharing, Qualitative Multiple Case Study, Indonesia, Supply Chain Resilience.



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INTRODUCTION

Food manufacturing small and medium-sized enterprises (SMEs) play a fundamental role in Indonesia's economy by contributing to employment creation, local economic development, food

security, and regional industrial growth. In cities such as Malang, East Java, food manufacturing SMEs constitute a significant portion of local manufacturing activities, producing a wide variety of processed food products including fruit chips, chili sauce, bakery products, frozen foods, snacks, and herbal beverages. Despite their important economic contribution, these enterprises operate in increasingly dynamic supply chain environments characterized by volatile raw material prices, fluctuating customer demand, supply disruptions, limited financial resources, and intense market competition. Such conditions require SMEs to develop effective collaboration with suppliers, distributors, logistics providers, and other business partners to ensure operational continuity and maintain competitiveness. Supply chain collaboration has therefore emerged as a strategic capability that enables organizations to coordinate activities, exchange information, share resources, and jointly respond to market uncertainty. Empirical evidence consistently indicates that collaboration contributes to improved operational performance, stronger supplier–customer relationships, reduced waste, and enhanced competitiveness, particularly among food-sector SMEs operating under resource constraints (Monnagaratwe & Mathu, 2022; Talib et al., 2023). These findings suggest that collaboration is no longer merely an operational practice but an essential strategic mechanism for sustaining business performance in increasingly uncertain environments.

The significance of supply chain collaboration has become even more evident following the COVID-19 pandemic, which exposed vulnerabilities throughout global and regional supply chains. Food manufacturing SMEs experienced disruptions in raw material procurement, transportation, inventory availability, and market demand, while simultaneously facing limited organizational resources to absorb these shocks. Research demonstrates that post-pandemic resilience depends heavily on organizational agility, sourcing flexibility, financial capability, and effective supply chain risk management (Brown et al., 2022). In developing-country contexts, including Southeast Asia, collaboration supported by digital technologies has become increasingly important for maintaining operational continuity and strengthening resilience during periods of environmental turbulence (Malesios et al., 2021; Sued & Hussin, 2020). Platform-based connectivity, digital information sharing, and collaborative communication have been identified as mechanisms that improve visibility and coordination among supply chain partners, although their effectiveness depends on organizational capabilities and environmental conditions (Linda et al., 2023; Qureshi et al., 2025; Rajala & Hautala-Kankaanpää, 2023). Consequently, strengthening collaborative relationships has become an important strategic response for Indonesian food manufacturing SMEs seeking to adapt to rapidly changing business conditions.

Supply chain collaboration encompasses coordinated activities among independent organizations that work together to achieve mutual operational and strategic objectives. The literature consistently identifies trust, communication, information sharing, joint planning, shared decision-making, and mutual commitment as core dimensions of successful collaboration (Alsaadi, 2024). Rather than operating independently, organizations participating in collaborative supply chains continuously exchange production schedules, inventory information, market intelligence, and delivery plans to improve responsiveness and reduce operational uncertainty. Within SME environments, these collaborative activities are often supported by informal governance mechanisms because limited organizational resources restrict the implementation of sophisticated contractual and technological systems. Consequently, interpersonal relationships, repeated

interactions, and mutual trust frequently substitute for formal governance structures, enabling SMEs to coordinate effectively despite resource constraints.

Among these collaborative dimensions, trust, communication, and information sharing have consistently emerged as the most influential relational mechanisms. Trust reduces perceived transaction risks, facilitates flexible business arrangements, and encourages partners to exchange sensitive operational information without excessive contractual safeguards. Open communication enables rapid problem resolution, while timely information sharing reduces information distortion and supports coordinated operational decisions throughout the supply chain (Nkwabi & Fallon, 2020; Popović et al., 2014). These relational capabilities have been widely explained through relational governance and social exchange perspectives, which argue that repeated interactions, reciprocal commitment, and mutual dependence strengthen long-term collaborative relationships (Lotfi et al., 2021). Within food manufacturing SMEs, where supplier relationships are frequently maintained over many years, trust-based governance often becomes a more practical coordination mechanism than detailed contractual agreements. Consequently, collaboration effectiveness depends not only on operational processes but also on the quality of interpersonal relationships established among supply chain partners.

Digital transformation has further reshaped collaboration practices among SMEs by providing affordable technologies that facilitate communication and operational coordination. While large organizations often implement enterprise resource planning systems and integrated supply chain platforms, SMEs generally rely on simpler digital applications such as cloud-based systems, collaborative platforms, and mobile communication technologies. These digital solutions enhance information visibility, accelerate communication, improve inventory management, and support collaborative decision-making across organizational boundaries (Thomas et al., 2021). Research also indicates that Internet of Things technologies and digital quality management systems improve traceability and collaborative governance within food supply chains (Opasvitayarux et al., 2022). Although consumer-oriented applications such as WhatsApp Business are rarely examined independently within the literature, broader studies consistently conclude that affordable digital communication technologies strengthen collaboration capabilities by enabling faster information exchange and more agile responses to operational changes (Linda et al., 2023). Nevertheless, technological adoption alone does not guarantee improved performance. Instead, digital technologies generate meaningful benefits when embedded within collaborative relationships characterized by trust, communication, and shared organizational commitment (Rajala & Hautala-Kankaanpää, 2023).

The existing literature provides substantial evidence regarding the positive relationship between supply chain collaboration and organizational performance; however, important research gaps remain. Most published studies adopt quantitative research designs that measure collaboration using structured survey instruments and statistical models. Although these studies successfully identify significant relationships among collaboration variables, they provide limited understanding of how collaborative practices actually develop and operate within everyday organizational settings. In particular, relatively few studies investigate how SMEs build trust, coordinate with suppliers, negotiate operational challenges, or maintain long-term collaborative relationships through daily interactions. This limitation is especially evident within developing-country contexts, where

informal governance frequently substitutes for formal contractual arrangements. Furthermore, qualitative investigations focusing specifically on food manufacturing SMEs remain limited, particularly within Southeast Asia and Indonesia (Jamaluddin & Saibani, 2021).

Another important gap concerns the limited understanding of how digital communication practices interact with relational governance in SME supply chains. Existing research increasingly recognizes the importance of digital platforms, cloud technologies, and collaborative information systems; however, relatively little evidence explains how accessible technologies are integrated into trust-based collaborative relationships within resource-constrained SMEs. Previous studies also call for more context-specific qualitative investigations examining governance mechanisms, information-sharing practices, institutional support, and collaboration processes within Indonesian and Southeast Asian supply chains (Musthafa & Tan, 2023; Saenchaiyathon & Wongthongchai, 2021). Moreover, scholars recommend connecting qualitative evidence with organizational performance outcomes to improve understanding of how collaborative mechanisms influence resilience and competitiveness across different institutional settings (Malesios et al., 2021; Talib et al., 2023). Addressing these gaps requires research designs capable of capturing the complexity of organizational interactions rather than relying exclusively on numerical measurement.

Responding to these limitations, the present study employs a qualitative multiple case study to explore supply chain collaboration practices among food manufacturing SMEs in Malang, Indonesia. The research investigates collaboration from multiple organizational perspectives by involving SME owners, production managers, purchasing officers, logistics coordinators, suppliers, distributors, and senior supply chain professionals. Specifically, the study seeks to answer four research questions: (1) how food manufacturing SMEs collaborate with suppliers, distributors, and other supply chain partners; (2) what factors facilitate effective collaboration; (3) what barriers hinder collaborative relationships; and (4) how SMEs maintain long-term collaborative partnerships. By examining multiple cases across interconnected organizations, the study develops a comprehensive understanding of collaboration mechanisms within Indonesian food manufacturing supply chains.

The study contributes to both theory and practice in several ways. Theoretically, it extends the supply chain collaboration literature by integrating insights from relational governance, the Relational View, Social Capital Theory, Social Exchange Theory, Transaction Cost Economics, and the Resource-Based View to explain collaboration within resource-constrained SMEs (Joshi et al., 2024). It also provides qualitative evidence that complements the predominantly quantitative body of existing research by illustrating how trust, communication, information sharing, and digital technologies jointly shape collaborative practices. Practically, the findings offer guidance for SME owners, suppliers, distributors, and policymakers regarding strategies to strengthen collaboration, improve resilience, and enhance operational performance. Finally, by focusing on food manufacturing SMEs in Malang during the June–August 2024 study period, this research addresses an important contextual gap within Indonesian supply chain management research and proposes a conceptual understanding of collaboration that may inform future comparative studies across developing economies.

METHOD

Research Design

This study employed a qualitative research approach using a multiple case study design to explore supply chain collaboration practices among food manufacturing small and medium-sized enterprises (SMEs) in Malang, Indonesia. A qualitative design was considered appropriate because the study sought to understand how collaboration is experienced, interpreted, and practiced by supply chain actors within their real organizational settings rather than to test predetermined causal relationships. Supply chain collaboration involves complex social interactions, informal governance mechanisms, trust development, and communication processes that cannot be adequately explained through quantitative measurement alone. Consequently, an in-depth qualitative investigation was necessary to capture the contextual and relational dimensions of collaboration.

The multiple case study approach was selected because it enables researchers to examine collaboration across several organizations while identifying similarities and differences between cases. Previous supply chain management studies have widely adopted multiple case designs to investigate supplier relationship management, relational governance, and collaborative practices among SMEs operating within interconnected supply chains (Lotfi et al., 2021; Monnagaaratwe & Mathu, 2022; Nkwabi & Fallon, 2020). Unlike a single case study, multiple case studies allow analytical replication through cross-case comparison, thereby strengthening the robustness and transferability of research findings. In supply chain contexts, this design is particularly valuable because collaboration occurs across organizational boundaries involving manufacturers, suppliers, distributors, and logistics partners rather than within a single organization.

Furthermore, qualitative multiple case studies have been extensively applied to investigate trust development, information sharing, joint planning, supplier relationships, and network governance in SME supply chains (Joshi et al., 2024; Zheng et al., 2021). These studies demonstrate that collaboration is shaped by context-specific organizational interactions that can only be understood through detailed examination of participants' experiences and interorganizational relationships. Following this methodological tradition, the present research investigated collaboration practices from multiple organizational perspectives to develop a comprehensive understanding of supply chain collaboration within Indonesian food manufacturing SMEs.

Research Setting

The research was conducted in Malang, East Java, Indonesia, between June and August 2024. Malang was selected because it is one of Indonesia's important regional centers for food manufacturing SMEs, hosting numerous enterprises producing fruit chips, bakery products, frozen foods, chili sauce, herbal beverages, snacks, and other processed food products. The region also possesses well-established supplier, distributor, and logistics networks that provide an appropriate context for examining collaborative supply chain practices.

The study focused on food manufacturing SMEs because this sector depends heavily on coordination with upstream suppliers and downstream distributors to maintain product quality, production continuity, and timely market delivery. The post-pandemic business environment further increased the importance of collaboration due to fluctuating demand, supply uncertainty, and raw material price volatility. Consequently, Malang provided an appropriate empirical setting for investigating how SMEs develop and maintain collaborative relationships under conditions of environmental uncertainty.

Case Selection and Participant Recruitment

Purposive sampling was employed to identify information-rich cases capable of providing detailed insights into supply chain collaboration. This sampling strategy is widely recommended in qualitative supply chain research because participants are selected based on their direct experience with the phenomenon under investigation rather than statistical representativeness (Lotfi et al., 2021; Nkwabi & Fallon, 2020).

Several inclusion criteria guided case selection. First, participating organizations had to operate within the food manufacturing supply chain, either as manufacturers or as key supply chain partners. Second, organizations were required to have established collaborative relationships with suppliers, distributors, or logistics providers. Third, participants needed direct responsibility for supply chain activities, purchasing, production planning, logistics, or strategic decision-making. Finally, participating organizations represented different food product categories to increase variation across cases.

The study involved thirteen key informants representing multiple organizational perspectives. Participants included four SME owners, two production and operations managers, two purchasing and logistics officers, two suppliers, two distributors, and one senior supply chain manager. Including both manufacturers and external supply chain partners strengthened analytical triangulation by capturing collaboration from different organizational viewpoints. Such multiple-perspective case selection has been recommended in qualitative supply chain management studies because it improves understanding of interorganizational dynamics and relational governance mechanisms (Monnagaaratwe & Mathu, 2022; Thomas et al., 2021).

Table 1. Characteristics of Research Participants

Informant	Organization	Position	Experience	Interview Focus
I1	Fruit Chips SME	Owner	14 years	Collaboration practices
I2	Chili Sauce SME	Production Manager	9 years	Collaboration practices
I3	Snack SME	Purchasing Officer	7 years	Collaboration practices
I4	Raw Material Supplier	Supplier Representative	15 years	Collaboration practices
I5	Food Distributor	Distributor Representative	11 years	Collaboration practices

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Informant	Organization		Position	Experience	Interview Focus
I6	Frozen Food SME		Owner	10 years	Collaboration enablers
I7	Food SME		Operations Manager	8 years	Collaboration enablers
I8	Food SME		Logistics Coordinator	6 years	Digital collaboration
I9	Bakery SME		Owner	13 years	Collaboration barriers
I10	Flour Supplier		Supplier Representative	18 years	Collaboration barriers
I11	Food Distributor		Sales Manager	9 years	Collaboration barriers
I12	Herbal SME	Beverage	Owner	12 years	Long-term relationships
I13	Supply Organization	Chain	Senior Supply Chain Manager	16 years	Long-term relationships

Data Collection

Primary data were collected through semi-structured interviews. This interview format provided sufficient flexibility to explore participants' experiences while ensuring consistency across interviews. An interview guide was developed based on the research questions and relevant supply chain collaboration literature. The guide covered four broad topics: collaboration practices, collaboration-enabling factors, collaboration barriers, and strategies for maintaining long-term relationships.

Each interview encouraged participants to describe their collaboration experiences with suppliers, distributors, and other supply chain partners. Discussions explored communication frequency, information-sharing practices, digital technology use, operational coordination, trust development, conflict resolution, supplier relationships, and responses to supply chain disruptions. Follow-up questions were used to obtain clarification and richer explanations whenever necessary.

To enhance data completeness, interview findings were complemented with supporting evidence, including company profiles, operational documents, researcher field notes, and organizational observations where available. Previous qualitative supply chain studies similarly recommend triangulating interview data with documentary and observational evidence to improve the validity of case study findings (Lotfi et al., 2021; Nkwabi & Fallon, 2020).

Data Analysis

Interview recordings were transcribed verbatim before analysis. The data were analyzed using thematic analysis because this method is well suited for identifying recurring patterns, concepts, and relationships within qualitative supply chain research. The analytical procedure followed established qualitative content analysis approaches widely applied in supply chain management research (Chouinard et al., 2022).

The first stage involved familiarization with the interview transcripts through repeated reading to develop an overall understanding of participants' experiences. The second stage consisted of open coding, during which meaningful statements related to collaboration, communication, trust, digitalization, barriers, and relationship management were systematically identified. The third stage grouped similar codes into broader analytical categories using constant comparison across interviews. Subsequently, categories were refined into higher-order themes representing major dimensions of supply chain collaboration.

Following theme development, within-case analysis was conducted to understand collaboration patterns within each participating organization. Cross-case analysis was then undertaken to compare similarities and differences among manufacturers, suppliers, distributors, and other supply chain actors. This comparative procedure enabled analytical replication and strengthened interpretation of recurring collaboration mechanisms across organizational settings. Previous qualitative SCM studies have similarly employed thematic analysis combined with cross-case comparison to identify relational governance patterns and collaboration mechanisms (Lotfi et al., 2021; Monnagaaratwe & Mathu, 2022).

The thematic analysis was guided by theoretical concepts derived from Supply Chain Collaboration Theory, the Relational View, Social Capital Theory, and Relational Governance. Theory-informed coding enabled the empirical findings to remain closely connected with existing scholarly knowledge while allowing new themes to emerge inductively from participants' experiences. Such theory-guided thematic analysis has been recommended for qualitative supply chain research because it strengthens conceptual interpretation without constraining inductive discovery (Lotfi et al., 2021; Monnagaaratwe & Mathu, 2022).

Table 2. Stages of Thematic Analysis

Stage	Analytical Activity	Expected Output
1	Familiarization with interview transcripts	Comprehensive understanding of participant experiences
2	Open coding	Initial descriptive codes
3	Constant comparison	Related code groups
4	Category development	Broader analytical categories
5	Theme generation	Core collaboration themes
6	Within-case analysis	Individual case interpretation
7	Cross-case analysis	Comparison across organizations
8	Conceptual interpretation	Final conceptual framework

Research Trustworthiness

Several strategies were employed to ensure the trustworthiness of the research findings. Credibility was enhanced through methodological triangulation by combining interview data with organizational documents, researcher observations, and field notes. Data-source triangulation was further strengthened by collecting evidence from manufacturers, suppliers, distributors, and supply chain professionals rather than relying on a single organizational perspective. Similar triangulation approaches have been widely recommended in qualitative supply chain management studies to

improve evidence quality and reduce potential researcher bias (Nkwabi & Fallon, 2020; Thomas et al., 2021)

Member checking was conducted by confirming key interpretations with selected participants to ensure that the findings accurately reflected their experiences. This process reduced the risk of misinterpretation while increasing the credibility of thematic interpretations. Thick description was also employed throughout the study by providing detailed explanations of organizational contexts, collaboration processes, participant characteristics, and research settings, thereby enabling readers to assess the transferability of findings to comparable SME environments (Lotfi et al., 2021).

Dependability and confirmability were strengthened through the maintenance of an audit trail documenting interview procedures, coding decisions, theme development, and analytical interpretations. Coding frameworks, theme definitions, and analytical decisions were systematically recorded throughout the research process to ensure transparency and replicability. Researchers also maintained reflexive notes documenting assumptions, analytical decisions, and potential biases that could influence data interpretation. Such auditability and reflexivity have been recommended as essential components of rigorous qualitative multiple case study research (Chouinard et al., 2022).

Finally, thematic saturation was monitored continuously during data collection and analysis. Interviews continued until no substantially new concepts or collaboration mechanisms emerged across the cases. Cross-case comparison further confirmed the consistency of major themes while also identifying contextual differences among food manufacturing SMEs, suppliers, and distributors. Consistent with previous qualitative supply chain studies, the combination of triangulation, member checking, thick description, audit trails, reflexivity, and cross-case synthesis enhanced the credibility, transferability, dependability, and confirmability of the study findings.

RESULT AND DISCUSSION

Overview of the Findings

The thematic analysis generated four principal themes corresponding to the study's research questions: collaboration practices, collaboration enablers, collaboration barriers, and long-term relationship maintenance. These themes were derived from interviews with thirteen informants representing food manufacturing SME owners, production and operations managers, purchasing and logistics officers, suppliers, distributors, and an experienced supply chain manager. Cross-case comparison indicated that supply chain collaboration was primarily informal, relationship-based, and supported by frequent communication through accessible digital platforms.

The findings showed that SMEs coordinated production, procurement, inventory, and distribution activities through regular communication, advance ordering, operational flexibility, and the exchange of demand, stock, price, capacity, and delivery information. Trust, transparency, commitment, and mutual support strengthened these practices. However, collaboration was frequently disrupted by raw material price volatility, demand uncertainty, delayed information, sudden orders, and supplier capacity constraints.

Supply Chain Collaboration Practices

Coordination of Production and Procurement

Participants described production and procurement coordination as a continuous process rather than a formally scheduled activity. SME owners and managers generally communicated with suppliers before production periods to confirm raw material availability, prices, delivery schedules, and expected order quantities. Informant I1, the owner of a fruit chips SME, reported conducting weekly communication with suppliers and planning raw material requirements in advance. This approach reduced the likelihood of production interruptions and enabled suppliers to reserve sufficient materials.

Informant I2 explained that the chili sauce enterprise adjusted supplier coordination whenever customer demand changed. However, delayed communication sometimes caused shortages or postponed production. Similarly, Informant I3 used a WhatsApp group to share information concerning prices, stock availability, and delivery schedules with suppliers. These findings demonstrate that production planning was closely linked to supplier responsiveness and the timeliness of information exchange.

The observed practices correspond with previous studies showing that SMEs coordinate by aligning production schedules, supplier lead times, inventory availability, and downstream demand signals across supply chain tiers (Bvuchete et al., 2020; Dong et al., 2023; Zahari et al., 2024). However, the cases in Malang did not demonstrate extensive use of formal systems such as vendor-managed inventory or collaborative planning, forecasting, and replenishment. Instead, similar coordination functions were performed through informal communication, repeated interaction, and advance ordering. This indicates that SMEs may replicate the operational principles of structured coordination systems without formally adopting them.

Coordination with Distributors

Coordination with distributors focused on production capacity, market demand, sales feedback, and delivery readiness. Informant I5 emphasized the importance of receiving production capacity information early so that distribution schedules could be aligned with product availability. The distributor also provided sales feedback to manufacturers, allowing SMEs to adjust production volumes and product priorities.

Informant I11 identified post-pandemic demand uncertainty as a major problem because fluctuating customer orders complicated production and distribution planning. In response, distributors frequently communicated changing market conditions to manufacturers. This downstream information was particularly important for products with limited shelf life or uncertain demand.

These findings are consistent with research emphasizing the importance of integrated manufacturer–distributor planning and shared demand information in coordinating production and replenishment (Tajik et al., 2024; Tambunan & Rimbawan, 2023). Nevertheless, the evidence from the present study shows that such integration remained relatively informal. Distributors did

not generally control inventory or production decisions directly; instead, they influenced decisions through market feedback, order projections, and frequent communication.

Operational Flexibility

Operational flexibility was another prominent collaboration practice. Informant I4, a raw material supplier, explained that flexible supply arrangements had developed through long-term partnerships with SME customers. Established customers were often prioritized during shortages or allowed to adjust order volumes according to changing production requirements. Informant I6 similarly reported that flexible payment arrangements were possible when strong trust had been established between the enterprise and its suppliers.

This flexibility enabled SMEs to respond to short-term demand fluctuations, delayed payments, and limited inventory availability. It also reduced the need for rigid contracts. However, flexibility was not unlimited. Informant I10 noted that sudden orders could not always be accommodated because flour stocks and supplier capacity were constrained.

The findings support earlier qualitative research showing that supplier coordination in SME food supply chains frequently combines informal relational governance with practical planning arrangements (Lotfi et al., 2021; Nkwabi & Fallon, 2020). The results also reinforce the view that trust-based coordination enables adaptation, but does not eliminate physical capacity constraints.

Forms of Information Sharing

Demand and Sales Information

Demand information was regularly shared between distributors and manufacturers. Informant I5 provided sales feedback to SME producers, while Informant I11 communicated changing market demand following the pandemic. This information helped manufacturers estimate production volumes and prioritize products with stronger market potential.

However, the level of detail varied considerably. Some partners exchanged only immediate order information, while others shared broader observations concerning customer preferences and market trends. The absence of standardized forecasting meant that many decisions remained reactive rather than predictive.

This practice aligns with literature identifying customer demand, sales forecasts, and end-market information as central forms of supply chain information sharing (Gupta et al., 2022; Laube & Böhme, 2017). The study nevertheless found that formal forecasts were uncommon. Most demand information was communicated through personal messages, telephone calls, or routine conversations.

Inventory, Price, and Capacity Information

Inventory and price information represented the most frequently exchanged operational data. Informant I3's WhatsApp group was used to communicate supplier stock, price changes, and delivery availability. Informant I9, a bakery owner, also relied on direct communication with suppliers when raw material prices changed and required renegotiation. Informant I10 provided information about flour stock limitations and the inability to satisfy unexpected orders.

Capacity information was especially important for distributors. Informant I5 required early information about the manufacturer's production capacity to coordinate deliveries and customer commitments. Similarly, production managers needed information about supplier capacity to determine whether materials would be available on time.

These findings reflect previous research emphasizing inventory visibility, production capacity information, and near-real-time stock data as important components of coordinated supply chain planning (Gupta et al., 2022; Tajik et al., 2024). Nevertheless, the SMEs in this study primarily relied on manually updated information rather than integrated inventory systems.

Production and Delivery Information

Participants also shared production schedules, order status, and delivery-delay information. Informant I7 emphasized the importance of open communication and early notification whenever delivery problems emerged. Such notifications enabled the SME to revise production schedules, identify alternative materials, or communicate possible delays to distributors.

Informant I2 reported that delayed information from suppliers frequently disrupted production. This illustrates that information sharing was valuable only when communicated early enough to support corrective action. Informants therefore distinguished between simply providing information and providing timely, actionable information.

The exchange of production and delivery information is consistent with studies showing that order status, lead times, replenishment schedules, and production plans help align manufacturing and distribution activities (Bvuchete et al., 2020; Dong et al., 2023). The present findings extend this understanding by showing that timeliness was more important than technological sophistication in many SME relationships.

Digital Communication Tools

WhatsApp-Based Coordination

WhatsApp was the dominant communication platform across the cases. It was used for confirming orders, reporting stock availability, negotiating prices, sharing delivery schedules, and communicating operational problems. Informant I3 described a supplier WhatsApp group

through which participants exchanged price, inventory, and delivery information. Informant I8 reported using WhatsApp Business for routine logistics coordination.

The widespread use of WhatsApp reflected its accessibility, low cost, familiarity, and speed. Participants did not require advanced technical training, and communication could occur across organizational boundaries without the implementation of complex enterprise systems. The application also preserved written records of conversations, orders, and delivery confirmations.

However, WhatsApp-based coordination had limitations. Information could become fragmented across individual and group conversations, and there was no automatic integration with production or inventory records. Consequently, the effectiveness of the platform depended on the discipline and responsiveness of individual users.

Shared Spreadsheets

Informant I8 also used Google Spreadsheet to coordinate logistics information. Shared spreadsheets enabled several users to view and update order, stock, or delivery data. Compared with ordinary messaging, this approach provided a more structured information format and improved visibility across participants.

Nevertheless, spreadsheet use was not widespread among all cases. Several SMEs continued to depend on direct personal communication and manual records. The difference reflected variations in digital capability, business size, and partner readiness.

These findings support previous research indicating that digital platforms improve visibility and information exchange when they are embedded within effective collaborative relationships (Rajala & Hautala-Kankaanpää, 2023; Thomas et al., 2021). They also confirm that digital connectivity alone is insufficient. The value of WhatsApp Business or shared spreadsheets depended on trust, accurate data entry, timely updates, and willingness to share relevant information.

Collaboration Enablers

Trust was the most prominent enabling factor across the cases. Informants associated trust with flexible payments, supplier prioritization, reduced monitoring, and willingness to provide early information. Informant I6 directly linked trust to flexible payment arrangements, while Informant I1 emphasized trust over formal contracts. Informant I13 similarly identified personal communication and mutual support as essential elements of collaboration.

Open communication and transparency were also central. Informant I7 stated that early notification of delivery delays allowed the organization to respond before production was seriously affected. Transparency concerning stock, capacity, and prices reduced uncertainty and facilitated renegotiation.

Commitment was reflected in payment discipline, quality consistency, and reliability. Informant I12 emphasized payment commitment, product quality, and joint evaluation as foundations for

sustained relationships. These findings support the view that collaboration is governed not only through information exchange but also through relational expectations concerning reliability, reciprocity, and responsible conduct.

Collaboration Barriers

Raw material price volatility was a recurring barrier, particularly for bakery and processed-food enterprises. Informant I9 explained that sudden price changes required repeated negotiations with suppliers and sometimes affected production costs and product pricing. Demand uncertainty, especially after the pandemic, complicated planning for manufacturers and distributors.

Information delays represented another significant barrier. Informant I2 reported that late supplier communication disrupted production, while Informant I7 stressed the need for early warnings about delivery problems. Sudden orders also created difficulties when suppliers lacked sufficient inventory or capacity, as described by Informant I10.

These barriers demonstrate that collaboration cannot fully eliminate environmental and operational uncertainty. Instead, collaboration provides mechanisms for managing uncertainty through communication, renegotiation, flexibility, and mutual support.

Long-Term Relationship Maintenance

Participants maintained long-term collaborative relationships through reliable payment, consistent quality, personal communication, joint evaluation, and reciprocal assistance. Informant I12 highlighted payment commitment and product quality as essential for preserving supplier confidence. Joint evaluation created opportunities to discuss recurring problems and improve future coordination.

Informant I13 emphasized personal communication, mutual support, and market information sharing. These practices strengthened relational continuity and encouraged partners to provide assistance during shortages or market disruption. Long-term collaboration was therefore sustained by repeated evidence of reliability rather than by contractual obligations alone.

Table 3. Summary of Themes and Supporting Evidence

Theme	Principal Evidence
Collaboration practices	Advance planning, regular communication, supplier flexibility, distributor feedback
Information sharing	Demand, price, stock, capacity, production, order, and delivery information
Digital coordination	WhatsApp, WhatsApp Business, and Google Spreadsheet
Enablers	Trust, transparency, commitment, reciprocity, and timely communication
Barriers	Price volatility, demand uncertainty, delayed information, sudden orders, and stock constraints
Relationship maintenance	Payment discipline, consistent quality, joint evaluation, personal communication, and mutual support

The findings demonstrate that supply chain collaboration among food manufacturing SMEs in Malang is primarily governed through relational rather than highly formalized mechanisms (Ramanathan, 2014). Trust, open communication, information sharing, commitment, and mutual support were repeatedly identified as the foundations of daily coordination with suppliers and distributors. These findings are consistent with qualitative studies showing that relational governance provides the social infrastructure through which supply chain partners coordinate activities, exchange sensitive information, and respond to operational problems (Lotfi et al., 2021; Nkwabi & Fallon, 2020). In the present study, trust enabled flexible payment arrangements, advance allocation of raw materials, rapid renegotiation, and supplier prioritization during shortages. Collaboration was therefore not merely an exchange of operational information but a socially embedded process sustained by repeated interaction and confidence in partner reliability.

The findings also indicate that relational governance and supply chain collaboration reinforce each other. Trust encouraged participants to communicate openly and share information concerning prices, stock availability, production capacity, and delivery delays. In turn, repeated information exchange and successful problem resolution strengthened trust and relationship continuity. This reciprocal pattern supports arguments that relational governance both facilitates collaboration and evolves through collaborative experience (Alsaadi, 2024; Lotfi et al., 2021; Monnagaaratwe & Mathu, 2022). The evidence from Malang further shows that collaboration is enacted through practical behaviors, including weekly supplier communication, early ordering, personal discussions, joint evaluation, and market information sharing. These practices represent the operational expression of relational norms such as reciprocity, transparency, and mutual dependence.

Trust-based governance appeared to substitute partially for formal contracts, particularly in long-standing relationships. Several informants regarded personal reliability, payment discipline, and consistent quality as more important than detailed contractual arrangements. This does not imply that formal governance is irrelevant. Rather, the findings suggest that formal agreements and relational governance perform complementary functions. Contracts may clarify responsibilities and commercial terms, while trust and open communication enable partners to manage unexpected changes that cannot be fully anticipated in formal documents. This interpretation is consistent with previous qualitative research indicating that contracts alone are insufficient for managing the daily contingencies of SME supply chains (Nkwabi & Fallon, 2020; Sued & Hussin, 2020; Thomas et al., 2021). In environments characterized by frequent price changes, uncertain demand, and sudden orders, relational governance provides flexibility that rigid contractual mechanisms may not readily offer.

The importance of relational flexibility was particularly evident when participants experienced raw material shortages, payment constraints, or production changes. Long-term suppliers occasionally adjusted order quantities, provided flexible payment terms, or prioritized established customers. These responses illustrate how relational capital can generate collaborative benefits that extend beyond routine transactions. Similar patterns have been reported in SME networks where trust-based cooperation creates relational rents and capabilities that individual firms could not generate independently (Lotfi et al., 2021). However, the findings also show that trust does not eliminate operational constraints. Suppliers remained unable to fulfill certain sudden orders when inventory or production capacity was insufficient. Relational governance therefore enhances adaptive

coordination, but it cannot substitute for physical resources, inventory availability, or production capability.

Digital communication strengthened these relational processes by increasing the speed and accessibility of information exchange. WhatsApp, WhatsApp Business, and Google Spreadsheet were used to communicate prices, stock levels, orders, production capacity, and delivery schedules. These tools provided relatively inexpensive alternatives to integrated enterprise systems and were compatible with the limited technological resources of SMEs. The findings support previous research suggesting that digital platforms can improve information visibility and collaborative responsiveness across supply chain tiers (Opasvitayarux et al., 2022; Thomas et al., 2021). Nevertheless, the empirical evidence also confirms that digital connectivity alone does not guarantee collaboration effectiveness. Information shared through messaging applications was useful only when it was accurate, timely, and supported by willingness to respond. This finding corresponds with studies showing that digital platform benefits depend on relational governance, absorptive capacity, and environmental conditions (Rajala & Hautala-Kankaanpää, 2023).

The interaction between digital tools and relational governance was especially important under market and environmental uncertainty. Participants faced changing demand, raw material price volatility, delayed deliveries, and stock limitations. Frequent communication and shared operational information enabled SMEs to identify disruptions earlier and adjust production, procurement, or distribution plans. Collaboration therefore contributed to resilience by improving sensing, coordination, and adaptive response. This interpretation is consistent with evidence that supply chain collaboration strengthens resilience by enhancing visibility, shared planning, and access to timely demand and inventory information (Brown et al., 2022; Nkwabi & Fallon, 2020; Thomas et al., 2021). In the Malang cases, resilience did not result from advanced technological infrastructure. Instead, it emerged from the combination of accessible digital tools, trusted relationships, flexible arrangements, and rapid interpersonal communication.

The findings further demonstrate that information timeliness was more important than technological sophistication. Several informants emphasized that early notification of delays or stock shortages allowed them to revise production plans and communicate potential disruptions to customers. Conversely, delayed communication caused production interruptions even when collaboration channels already existed. This distinction suggests that effective information sharing should be evaluated not only according to the amount of data exchanged but also according to relevance, accuracy, timing, and usability. The result extends existing discussions of platform-enabled collaboration by showing that low-cost technologies can support resilience when partners have established norms regarding prompt and transparent communication.

Long-term relationship continuity was maintained through repeated demonstrations of commitment. Reliable payment, consistent product quality, joint evaluation, personal communication, and reciprocal assistance were regarded as evidence that a partner remained dependable. These practices reflect Social Exchange Theory and Social Capital Theory, which explain how reciprocal behavior, shared norms, and accumulated trust support cooperation over time. They also align with the Relational View, which proposes that interorganizational relationships can become sources of collaborative advantage. The study therefore indicates that

long-term collaboration is not sustained by trust as an abstract attitude alone. Trust is continually reproduced through observable behaviors that confirm reliability and mutual responsibility.

The study contributes to supply chain collaboration research by showing how relational governance, digital communication, and operational resilience interact within resource-constrained food manufacturing SMEs. It offers context-specific qualitative evidence from Indonesia, where informal networks and accessible communication technologies play substantial roles in supply chain coordination. Future research should examine how these relationships evolve as SMEs adopt more advanced digital platforms, formal planning systems, and integrated inventory technologies. Comparative studies across Indonesian regions and Southeast Asian countries could identify how institutional conditions, infrastructure, and industry characteristics shape collaboration. Mixed-method research could also connect qualitative mechanisms such as trust, flexibility, and information timeliness with measurable indicators of resilience and operational performance. Such work would strengthen understanding of how relational and technological capabilities can be combined to improve collaboration in developing-economy food supply chains.

CONCLUSION

This study explored supply chain collaboration practices among food manufacturing small and medium-sized enterprises in Malang, Indonesia, using a qualitative multiple case study approach. The findings show that collaboration is primarily enacted through regular communication, advance coordination, information sharing, supplier flexibility, and direct interaction with distributors. These practices are supported by accessible digital tools, particularly WhatsApp, WhatsApp Business, and shared spreadsheets, which enable SMEs to exchange information concerning prices, inventory, production capacity, orders, and delivery schedules.

Trust emerged as the central governance mechanism underlying collaboration. It enabled flexible payment arrangements, supplier prioritization, rapid renegotiation, and the exchange of sensitive operational information. Open communication, transparency, commitment, reciprocity, and mutual support further strengthened collaborative relationships. The study also found that long-term collaboration is maintained through reliable payment behavior, consistent product quality, joint evaluation, personal communication, and repeated demonstrations of partner dependability.

Despite these collaborative mechanisms, SMEs continued to face substantial operational barriers. Raw material price volatility, fluctuating demand, delayed information, sudden orders, stock shortages, and supplier capacity limitations frequently disrupted production and distribution. Collaboration did not eliminate these constraints, but it improved the ability of firms to identify problems earlier, adjust plans, negotiate practical solutions, and maintain operational continuity. The findings therefore indicate that supply chain resilience among food manufacturing SMEs arises from the interaction of relational capabilities, timely information exchange, operational flexibility, and simple digital technologies (Jidda, 2025; Pettit et al., 2019).

The principal theoretical contribution of this study lies in explaining how relational governance and digital communication jointly shape supply chain collaboration in resource-constrained SME environments. The findings extend the Relational View, Social Capital Theory, Social Exchange

Theory, and supply chain collaboration literature by demonstrating that trust is not merely an antecedent of collaboration. It is continually reinforced through successful coordination, reciprocal assistance, timely communication, and reliable performance. The study also shows that digital technologies do not independently generate collaboration benefits; their effectiveness depends on the relational norms and organizational practices within which they are used.

From a managerial perspective, SME owners and supply chain partners should prioritize timely and transparent communication, structured information-sharing routines, payment discipline, and periodic joint evaluation. Low-cost digital tools should be used more systematically to record orders, monitor stock, communicate production capacity, and provide early warnings of possible disruption. Suppliers and distributors should also be included in planning discussions where demand variability or material shortages are likely to affect production and delivery decisions.

The findings have implications for policymakers and business-support institutions. Programs designed to strengthen SME supply chains should combine digital capability development with training in supplier relationship management, collaborative planning, communication, and conflict resolution. Support for shared digital platforms, reliable internet infrastructure, and interorganizational networking may improve the resilience and competitiveness of regional food manufacturing ecosystems.

This study is limited by its focus on thirteen informants within one geographic area and by its reliance primarily on participants' accounts. Future research should compare collaboration practices across regions, industries, and enterprise sizes. Longitudinal studies could examine how trust and collaboration evolve over time, while mixed-method and quantitative studies could test the relationship between relational governance, digital capability, resilience, and operational performance. Further research should also investigate power asymmetry, institutional support, digital maturity, and the transition from informal collaboration to more formalized supply chain integration.

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