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Increasing Supply Chain Transparency as a Competitive Advantage for SMEs: The Case of Christopher Ward

Marcel Jaun

marcel.jaun@bfh.ch

Bern University of Applied Sciences: Berner Fachhochschule https://orcid.org/0009-0006-4202-7668

Jörg H. Grimm

Bern University of Applied Sciences https://orcid.org/0000-0002-7559-9500

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Abstract

In response to environmental degradation and social exploitation along global value chains, authorities have introduced supply chain regulations for large companies, and the concept of supply chain transparency (SCT), which involves disclosing information about supply chains, has become increasingly important. However, small and medium-sized enterprises (SMEs) are often not directly subject to such regulations, and the use of SCT among them has received little research attention. This study analyses how SCT can support SMEs that want to move away from growth-oriented value extraction and use SCT as a strategy to gain a competitive advantage. Based on a qualitative content analysis and a case study of the watchmaker Christopher Ward, the study presents a role-based framework that conceptualises SCT as fulfilling four interrelated roles: 'understanding' and 'prioritising' for internal orientation and resource allocation; 'explaining' and 'signalling' for external communication and market positioning. The findings suggest that the strategic value of SCT derives from the combination of these four roles. Three research propositions are presented for future validation: Firstly, the trust-building effect of SCT in SMEs is more dependent on voluntary and authentic disclosure than on completeness. Secondly, SCT can, to some extent, offset structural power imbalances between SMEs and larger firms. Thirdly, in markets with quality uncertainty, SCT can partially substitute for marketing-intensive signals by providing credible information about values and quality. The study therefore contributes to the ongoing academic debate on the practical application of SCT among SMEs.

Keywords: supply chain transparency, supply chain visibility, sustainable organising, small and medium-sized enterprises, small business strategy

Marcel Jaun (Corresponding Author)
Bern University of Applied Sciences
Department of Industrial Engineering
Quellgasse 12, 2502 Biel/Bienne, Switzerland
Email: marcel.jaun@bfh.ch
ORCiD: 0009-0006-4202-7668

Jörg H. Grimm
Bern University of Applied Sciences
Department of Industrial Engineering
Quellgasse 12, 2502 Biel/Bienne, Switzerland
Email: joerg.grimm@bfh.ch
ORCiD: 0000-0002-7559-9500

1 Introduction

Historically, the design of supply chains (SCs) has prioritised efficiency over transparency (Gualandris et al. 2021). But with increasing globalisation, SCs have become fragmented and branched networks, in which business-to-consumer (B2C) companies often lose contact with entities beyond their first-tier suppliers (Delgado et al. 2025; Schaëfer et al. 2025). As a result, information about upstream production conditions becomes incomplete. This creates visibility boundaries along the SC (Busse et al. 2017), as well as knowledge gaps between companies and their affected stakeholders regarding operational, social, and environmental conditions (Jia et al. 2024).

In such settings, companies may benefit from limited transparency by maintaining cost-efficient SC configurations (Sodhi & Tang 2019; Mollenkopf et al. 2022). At the same time, these knowledge gaps may hinder efforts to mitigate negative outcomes, such as poor working conditions, human rights violations, or environmental damage (Haack et al. 2012). In response, consumers, regulators, and capital markets increasingly demand information about SC practices, commonly referred to as supply chain transparency (SCT) (Wang et al. 2024; Zheng et al. 2024; Schaëfer et al. 2025).

To address these concerns, legislative initiatives have been introduced that require large companies to report on their SC (Schäfer 2023). Although small and medium-sized enterprises (SMEs) are often not directly subject to such regulations, they are increasingly affected indirectly. Large firms pass transparency requirements downstream to their SME suppliers, as they remain legally and reputationally accountable for misconduct within their SCs (Soundararajan and Brown 2016).

Despite these developments, regulatory transparency initiatives often fail to achieve their intended outcomes (Levi-Faur 2005; Mol 2015). Rather than leading to improvements in SC practices, disclosure is frequently used as a symbolic measure to protect legitimacy and reputation (Haack et al. 2012; Pinnington et al. 2023). Gold and Heikkurinen (2018) describe this phenomenon as the 'transparency fallacy', which describes that increased transparency does not automatically lead to accountability or responsible behaviour. Consequently, the current transparency regime often delivers limited sustainability improvements while imposing significant reporting efforts (Michelon et al. 2015).

This limitation is relevant for SMEs. Due to their limited resources, SMEs rarely have the capacity to implement end-to-end transparency across multiple tiers (Eggers 2020). Establishing and maintaining SCT is costly and labour-intensive (Busse et al. 2017). Therefore, it is unlikely that SMEs will adopt SCT practices merely to comply with external expectations (Wilhelm et al. 2016). SCT must offer clear benefits to justify the necessary investment (Hillary 2004).

At the same time, many B2C SMEs operate in markets characterised by strong quality uncertainty. In such environments, buyers often find it difficult to distinguish between high- and low-quality offerings, which puts companies that invest in high-quality production or sustainability practices at a disadvantage (Akerlof 1970; Kessler 2001). This issue is a consequence of information asymmetries, in which high-quality providers risk being displaced by lower-quality competitors (Kim and Kim 2019; Mamada 2022). For SMEs, this challenge is exacerbated by their reduced visibility compared to large, marketing-intensive companies (Bar-Isaac and Tadelis 2008). Consequently, responsible and high-quality SMEs may find it difficult to communicate and monetise their value propositions (Hahn and Kühnen 2013).

Academic literature conceptualises transparency as a disclosure-based mechanism intended for external accountability, primarily within large enterprises (Morgan et al. 2023; Jia et al. 2024). This creates a research gap: While the role of SCT in large enterprises is well documented, there is limited insight into how SMEs can strategically use SCT for purposes beyond compliance. This could present a hidden opportunity. Although SMEs are often considered the backbone of an economy (Eggers 2020), they also have the flexibility to adopt their own values and implement sustainable organisational structures that challenge the long-standing business paradigm of growth and profit maximisation (Ergene et al. 2021).

Motivated by this gap, this study addresses the following research question: 'What strategic roles does SCT fulfil in competitive B2C markets for SMEs?' The study first conducted a qualitative content analysis of the academic literature and developed a role-based framework for SCT comprising four roles: Understanding, Prioritising, Explaining, and Signalling. The study then conducted a single-case study of Swiss-British watchmaker Christopher Ward (CW) to empirically illustrate these roles. CW wants to challenge the high prices of established luxury brands. In doing so, they reduced marketing expenditure and instead relied on transparency regarding pricing and operational structures, while selling directly to consumers. This makes CW a relevant case study for illustrating how SCT can generate strategic value beyond compliance.

The remainder of this paper is structured as follows. First, the paper provides a review of current research on SCT, followed by a discussion of its theoretical foundations. The paper then describe the research methodology. The results are divided into two parts: the conceptual development of the framework and the empirical case study findings. Finally, results are discussed and three propositions for future research suggested.

2 State of Research

2.1 Supply Chain Transparency and Its Role

SCT is the intentional and voluntary disclosure of SC information to internal and external stakeholders (Montecchi et al. 2021). SCT must be distinguished from related terms such as visibility, traceability, and disclosure (Budler et al. 2024).

Visibility is defined as an organisation's ability to access internal data on SC actors, processes, and resources (Montecchi et al. 2021). It is a necessary but not sufficient condition for transparency (Raja and Mohan 2025). Traceability is the technical capability to track products, materials, or components across SC stages. In contrast, disclosure refers to the intentional communication of information to stakeholders (Schäfer 2023). SCT is therefore a combination of visibility (internal), traceability (integration) and disclosure (external) (Montecchi et al. 2021).

Various data can be shared, such as supplier information, material specifications, production processes, financial transactions, or sustainability criteria (Schäfer 2023; Yang and Lu 2025). A key consideration within SCT is the stakeholder perspective (Busse et al. 2017). While information typically flows 'downstream' to consumers, it can also be utilised within the SC to build partnership-based cooperation, referred to as management transparency (Duan et al. 2021; Nawaz and Wagner 2025). But SCT is determined not only by the quantity of data shared, but also by its perceived quality, accuracy, comprehensibility and timeliness (Mollenkopf et al. 2022).

Research has identified a variety of roles for SCT, which can be categorised into roles affecting internal or external stakeholders (Freeman 1984). From an internal stakeholder perspective, SCT supports organisational understanding and prioritisation. It contributes to risk identification and mitigation by improving visibility into multi-tier supply networks (Liu et al. 2024) and enabling the identification of structural vulnerabilities (Baik et al. 2024). SCT may also facilitate operational coordination and cross-functional alignment by providing timely status updates through enhanced traceability (Swink et al. 2024). Strategically, SCT can structure and contextualise SC information to reduce internal asymmetries (Bernstein 2012), helping organisations to avoid misjudgements about SC complexity (Fraser et al. 2020).

From an external stakeholder perspective, SCT enables companies to explain their SC structure and practices to prove compliance with regulatory requirements by disclosing supplier identities, sourcing locations, or audit outcomes (Egels-Zandén and Hansson 2016; Fraser et al. 2020). Beyond compliance, SCT is linked to building trust, legitimacy and reputation, as it signals responsibility, openness and moral intent (Geissdoerfer et al. 2018; Mollenkopf et al. 2022). These effects have also been linked to increased customer purchase intentions (Duan et al. 2021). SCT might also partially replace trust by providing formal visibility (Bernstein 2012) or by disclosing cost structures behind pricing (Nawaz and Wagner 2025). Furthermore, SCT may influence power relations within supply networks (Schlagwein et al. 2017; Gualandris et al. 2021). Flyverbom et al. (2015, p. 392) describe this phenomenon, stating that “to make sense of how transparency relates to power requires that we define transparency as a social process of managing what is visible and present, as well as invisible and absent, a process that produces multiple and extensive kinds of control and ordering.”

Despite the variety of roles, empirical insights into SCT in SMEs remain limited (Iranmanesh et al. 2023; Liu et al. 2024). Many SMEs lack the financial resources and technical capabilities to implement advanced digital solutions, such as AI-driven analytics or blockchain-based traceability systems (Jia et al. 2024). Digitalisation may further reduce entry barriers, enabling SMEs to adopt transparency practices that align with their capabilities (Minami et al. 2012; Savimäki et al. 2025).

2.2 Theoretical Positioning

To position this study within established theoretical perspectives, this study consideres four theories: stakeholder theory (Freeman 1984), organisational information processing theory (OIPT) (Galbraith 1974), the ‘market for lemons’ (Akerlof 1970), and signalling theory (Spence 1973).

As SCT includes the act of disclosing information, the question is to whom SC information can and must be disclosed (Jia et al. 2024). To better understand, this study applies stakeholder theory. Stakeholder theory defines stakeholders as any group or individual who can influence or be influenced by the achievement of organisational goals (Freeman 1984). The core objective of stakeholder management is to balance the often competing interests of various groups to ensure a company's long-term success (Meixell and Luoma 2015). Literature offers various classification approaches. For example, Clarkson (1995) distinguishes between primary and secondary stakeholders, or Fassin (2009) between direct and indirect stakeholders.

This study adopts the distinction between internal and external stakeholders (Freeman 1984). Internal stakeholders include all actors within the focal organisation, such as employees, management, the board of directors and, in certain cases, shareholders. External stakeholders are broader in context. They may be customers, retailers, suppliers, or they may be part of the market environment (e.g. competitors, banks, research groups), the legal system (e.g. governments and courts) or society (e.g. the media, unions, NGOs) (Fassin 2009; Villena et al. 2021; Mahajan et al. 2023).

Moving on to the second theory, this study applies OIPT to conceptualise the core mechanisms of SCT to explain how SC information is processed, structured, and communicated to internal and external stakeholders (Galbraith 1974; Niedenzu et al. 2019). OIPT describes two fundamental strategies for coping with uncertainty. Organisations can either reduce their need for information processing by simplifying tasks, creating slack resources or decentralising decision-making, or they can increase their capacity for information processing by investing in vertical information systems (e.g. IT and analytics) and lateral relations (e.g. cross-functional or inter-organisational collaboration) (Galbraith 1974).

OIPT has also been adopted in other areas of SCM research. It is mainly used to explain how firms respond to increasing complexity through digitalisation (e.g. IoT and blockchain), data integration and advanced analytics. These can be viewed as modern forms of vertical information systems that increase processing speed and quality (Srinivasan and Swink 2015; Zhu et al. 2018; Yang et al. 2025). In this context, SCT is often seen as a technical enabler that enhances information availability and decision quality (Wong et al. 2020).

Moving on to the third theory, this study uses Akerlof's (1970) 'market for lemons' theory to understand the dynamics of quality uncertainty. Quality uncertainty explains how information asymmetries between sellers and buyers can lead to adverse selection. When buyers cannot reliably assess product quality in advance, they are only willing to pay the average price. Consequently, high-quality producers are unable to realise the full value of their investments and may eventually be driven out of the market by lower-quality competitors.

Quality uncertainty is particularly relevant for marketing-intensive consumer markets, where price signals are often distorted by marketing and advertising rather than reflecting underlying production quality (Kirmani and Rao 2000; Bagwell 2007; Haack et al. 2012). For SMEs, the 'lemons problem' is exacerbated by their limited marketing budgets and lower brand visibility compared to large established companies (Baker and Sinkula 2005; Bar-Isaac and Tadelis 2008).

In this context, SCT can be interpreted as a corrective mechanism that addresses market failure by reducing information asymmetry. By disclosing SC structures, sourcing decisions, production processes, or cost breakdowns, companies can provide consumers with alternative quality signals that are less susceptible to manipulation than traditional marketing claims (Suchman 1995; Septianto et al. 2021).

The fourth theoretical perspective is Spence's (1973) 'signalling theory', which complements the 'lemons framework' by explaining how actors can credibly communicate unobservable qualities in situations of asymmetric information (Connelly et al. 2024). A signal is effective when it is costly for low-quality actors to imitate, but relatively inexpensive for high-quality ones (Bergh et al. 2014; Duan et al. 2021). In SC contexts, SCT can fulfil this criterion when disclosing detailed, verifiable and potentially sensitive information (Carlos and Lewis 2018).

From this perspective, SCT plays a key role in signalling organisational quality and capability (Mollenkopf et al. 2022). For SMEs, this signalling effect is particularly powerful because radical transparency becomes difficult for low-quality, larger competitors to imitate, especially when embedded consistently across the business model (Septianto et al. 2021).

Signalling theory also shows that transparency is not inherently beneficial. To avoid perceptions of hypocrisy or opportunism, signals must align with actual practices and with other organisational signals. This underlines the importance of SCT linking internal information processing with external market signalling, rather than being seen as an isolated communication measure (Septianto et al. 2021; Mollenkopf et al. 2022).

3 Research Design

3.1 Qualitative Content Analysis

To identify and structure the roles of SCT, the study applied qualitative content analysis (Mayring and Fenzl 2019). The goal was to develop an initial, literature-informed conceptual framework. Due to the exploratory nature of the study and the lack of a consolidated established framework, the categories were developed inductively, without a predefined coding scheme.

The empirical basis consisted of academic publications addressing the functions, effects, purposes or strategic application of SCT. Due to the fragmented literature, no systematic literature review has been conducted. Instead, a semi-systematic approach has been adopted to capture a variety of conceptually relevant perspectives on SCT across SCM. Literature was identified iteratively through database searches and backwards and forward citation tracking until thematic saturation regarding SCT roles was reached. The units of analysis were explicit statements that assigned SCT a function, role, effect or intended organisational use. These statements can be formulated explicitly or implicitly and usually comprise one or more sentences that coherently convey how transparency is used in the organisational context.

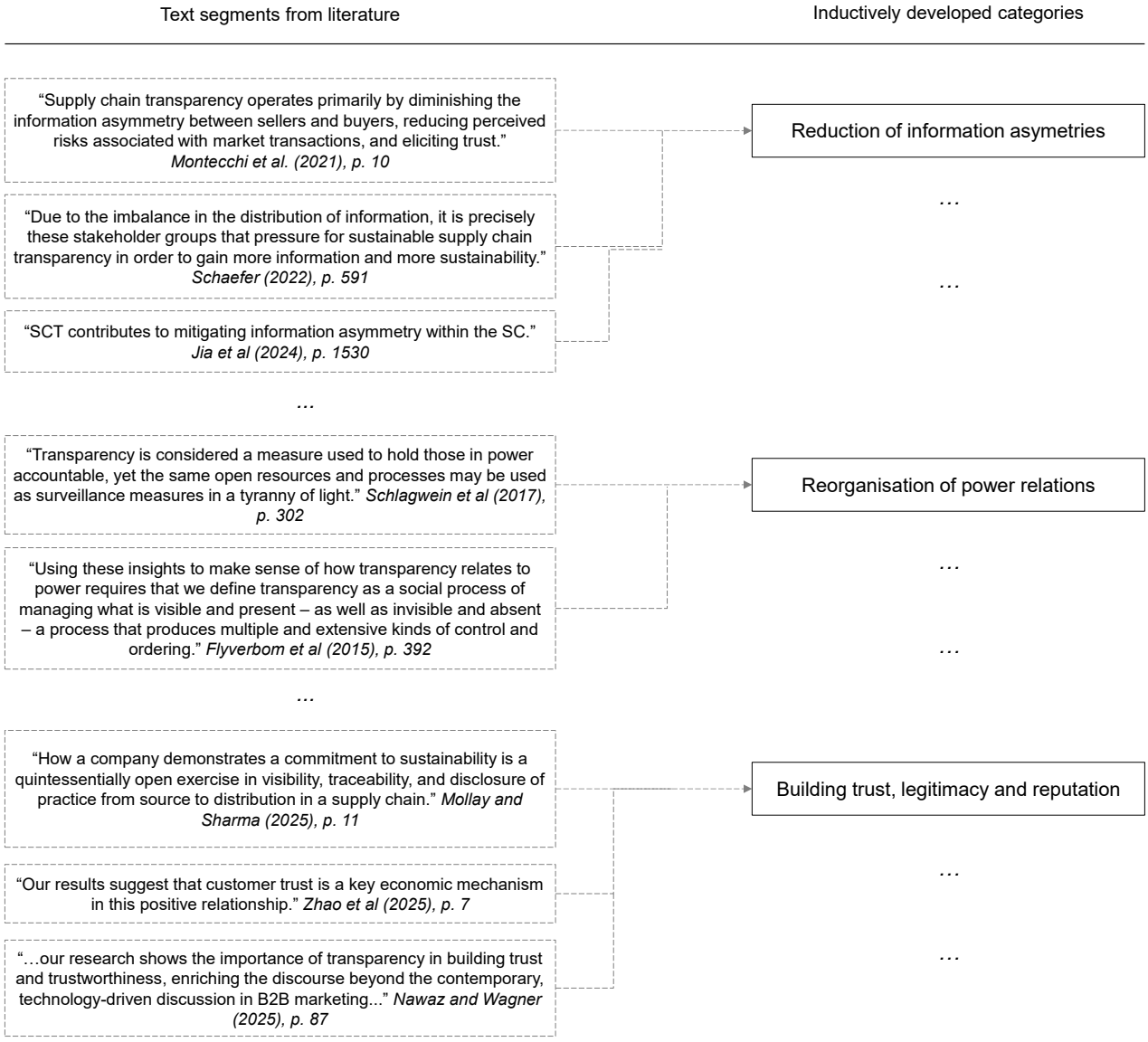


Fig. 1 Inductive category development based on qualitative content analysis

In a first step, the text passages were systematically extracted. These extracted text segments are shown in Figure 1 as an excerpt under 'Text segments from literature'. All statements were then paraphrased and contextualised.

In a second step, similar statements were grouped together based on conceptual proximity. These groupings were then repeatedly reviewed and adjusted to avoid redundancy. Thirteen content categories representing the variety of SCT roles identified in the literature were derived. Figure 1 shows an excerpt of these categories and Figure 2 shows them all.

In a third step, the categories were organised into an analytically clear and intuitive framework, grouping SCT roles together at a higher level of abstraction. The 13 categories were therefore aggregated into four higher-order category clusters, shown in the centre of Figure 2. These clusters are referred to as the four roles for SCT.

The higher-order clusters were structured based on established theories ex post. First, stakeholder theory was applied to distinguish between clusters based on their primary target audience. The clusters 'Understanding' and 'Prioritising' were consequently assigned to internal stakeholders, and 'Explaining' and 'Signalling' to external stakeholders.

OIPT was then used as an interpretative ordering logic. The four clusters were differentiated according to whether their primary function was to reduce or increase information-processing needs and capacity. Therefore, theory was used for interpretation rather than as an a priori normative framework. The naming and delineation of the higher-order category clusters evolved through multiple iterations. Labels were refined until conceptually distinct yet exhaustive enough terms were identified. The full coding table can be found on Mendeley Data (Jaun and Grimm 2026).

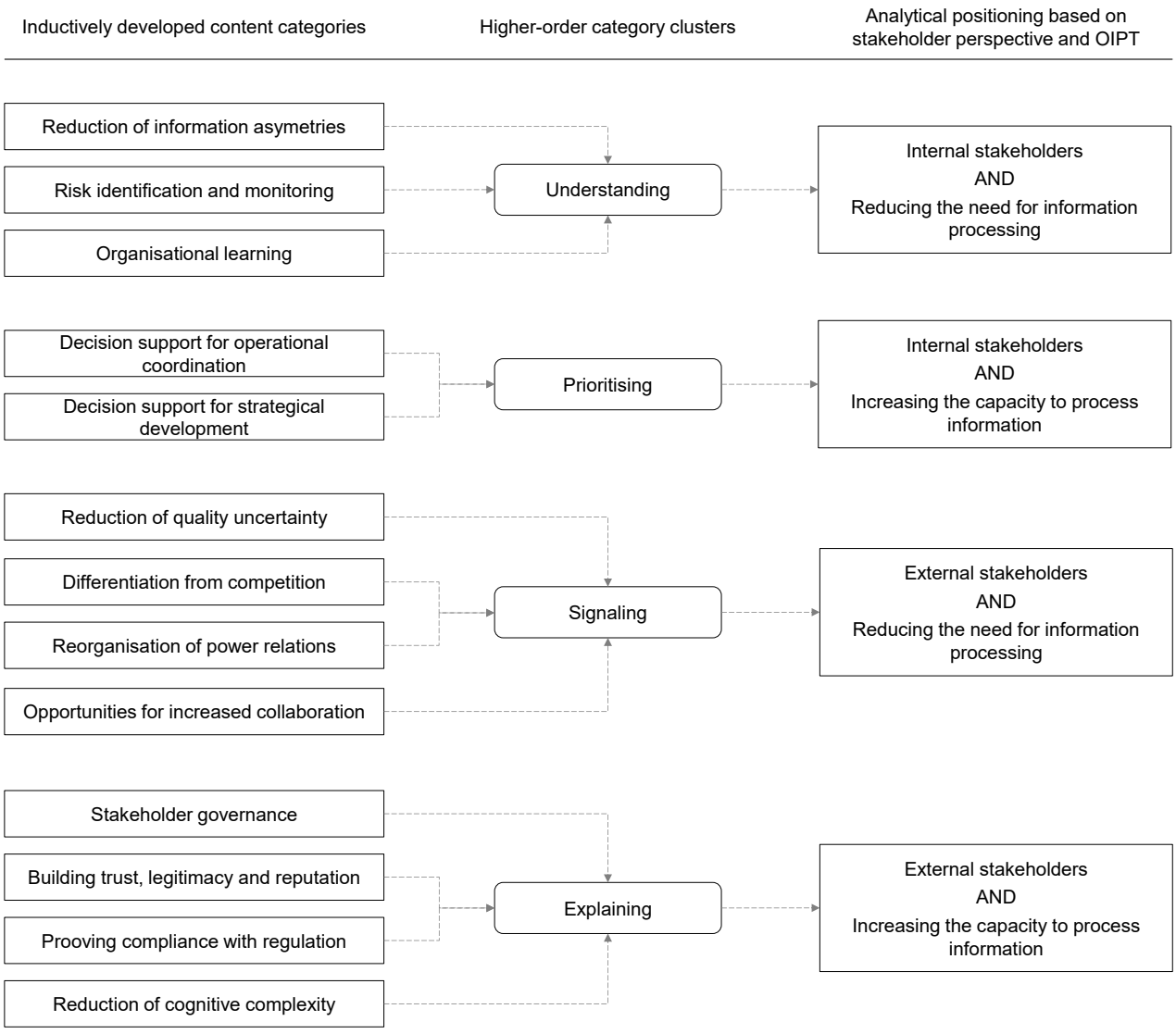


Fig. 2 Category structuring and abstraction

3.2 Empirical Illustration: The Case of Christopher Ward

To illustrate, contextualise and further differentiate the proposed framework, a single-case study of Christopher Ward (CW). The case study was not designed to test the categories or evaluate the framework's completeness. Instead, the goal was to describe how the identified roles could manifest in an SME context and highlight nuances not evident in the literature.

Given the scope of the research, the study analysed an SME operating in a competitive consumer goods market characterised by high marketing intensity and emotional branding. The company should already have taken explicit steps towards SCT. The Swiss watch industry was a suitable context, and CW was a good fit, as its business model focuses on transparency as a key differentiator.

CW was founded in England in 2004. In 2014, it acquired the Swiss manufacturer Synergies Horlogères SA. Today, CW employs around 130 people. The company is often perceived in the market as an 'underdog that challenges the big players' and has established itself as one of the most prominent British watch brands. As a significant proportion of production takes place in Switzerland, CW qualifies for the “Swiss Made” label. From a business model perspective, CW sought to challenge established luxury watch brands by offering high-quality products at significantly lower prices. They eliminated traditional retail mark-ups by selling directly to customers online. This approach was supported by avoiding expensive, recurring marketing campaigns and by a self-imposed pricing rule that the final retail price should not exceed three times the manufacturing cost. This focus on transparency and perceived fairness towards customers remains a core attribute of CW.

Since 2014, the watches have been designed in England and produced in Switzerland. CW operates a global SC with around 40 tier-1 suppliers, depending on the product group. Most of these suppliers are located in the DACH region, particularly Switzerland, due to the concentration of specialised watchmaking capabilities. Other suppliers are based in Asia, primarily in Hong Kong and Bangkok, Thailand. Components sourced include complete movements, movement components, bracelets, dials, cases, hands, and luminous pigments. Figure 4 shows the SC map and the geographic origins of the components.

The company experienced one of its strongest growth periods over the last four years, with revenues increasing by 2.5-3 times. This growth directly impacted SCM. In 2024, CW appointed an SC Director to professionalise SCM. Prior to this, SC responsibilities had largely been handled by the Product Manager.

The SC map was developed in 2021 through several workshops with the Product Manager (who was also the Supply Chain Manager) and the Swiss CEO. Further data collection followed iteratively. In summer 2024, an interview was conducted with the Product Director, followed by an interview with the SC Director in autumn 2025. Table 1 provides an overview of all workshops/interviews conducted.

Table 1 Details of interviewee sample at Christopher Ward

No.	Year	Format	Position of Participant	Years of Experience	Duration
1	2021	Interview	Product (and SC) Manager	10	120 min
2	2021	Workshop	Product (and SC) Manager	10	120 min
3	2021	Workshop	CEO of the Swiss HQ	30	30 min
4	2021	Workshop	Product (and SC) Manager	10	120 min
5	2021	Interview	Logistics Manager	12	20 min
6	2024	Interview	Product Director	14	35 min
7	2025	Interview	Supply Chain Director	25	35 min

In addition, publicly available data was analysed, including the company website, all issues of the customer magazine Loupe published between 2018 and 2025, and public statements and media coverage. Table 2 provides an overview of the main public sources analysed.

The case data were analysed deductively but not codified. The SCT role-based framework provided the analytical structure for the case analysis. First, empirical observations were assigned to the four SCT roles, and then illustrative examples were identified for each role. Not all categories were expected to be observable in the case. The case was subsequently analysed within the framework's four roles. Rather than adopting a chronological format, the study followed a role-by-role analysis.

Table 2 Details of the main publicly analysed data sources

No.	Access Date	Source	Content	Link
1	12.2025	Christopher Ward	Homepage	https://www.christopherward.com/
2	12.2025	Christopher Ward	Forum	https://www.christopherwardforum.com/
3	12.2025	Christopher Ward	Do Your Research	https://www.christopherward.com/do-your-research.html
4	12.2025	Christopher Ward	Magazine “Loupe”	https://www.christopherward.com/int/loupe-magazine
5	12.2025	Issuu	Loupe (all Editions)	https://issuu.com/christopher-ward
6	12.2025	British Watchmakers	Homepage	https://britishwatchmakers.com/
7	12.2025	Bellwether	Bellwether survey	https://britishwatchmakers.com/watch-this/bellwether/
8	12.2025	Hodinkee	Bellwether survey	https://www.hodinkee.com/articles/six-insights-from-the-bellwether-kpmg-report-on-the-british-horological-industry
9	12.2025	Watchpro	Alliance of British Watchmakers	https://www.watchpro.com/alliance-of-british-watch-and-clock-makers-attracts-first-35-member-firms-in-8-weeks/
10	12.2025	Financial Times	Growth of CW	https://www.ft.com/content/c02c2c48-e39d-4b08-88d7-66c733e98f6d
11	12.2025	YouTube	Q&A with Mike France (Co-Founder)	https://britishwatchmakers.com/open-dial/fears-and-chris-ward/
12	12.2025	Reddit	Q&A with Chris Ward (Co-Founder)	https://www.reddit.com/r/Watches/comments/5udrcj/ama_i_am_christopher_ward_ask_me_anything/

4 Conceptual Results

Figure 3 illustrates the developed role-based framework for SCT. The x-axis indicates who receives the information, and distinguishes between internal and external stakeholders. The y-axis captures the effect of SCT on information processing. SCT can either reduce the need for information processing or increase the capacity to process information. Combining these two axes yields a framework with four roles for SCT. The framework does not present the roles as mutually exclusive categories, since they interact, as shown by the overlapping circles.

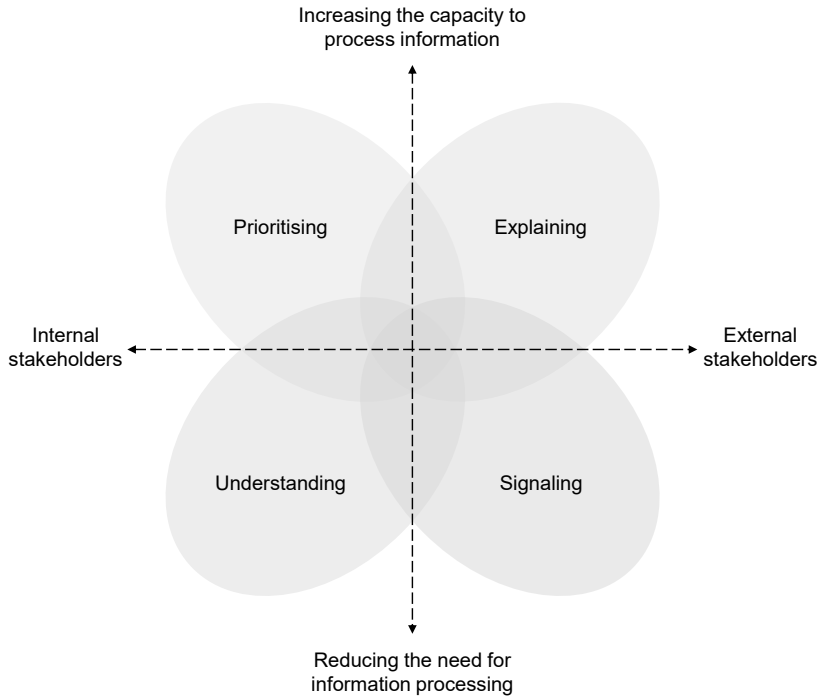


Fig. 3 Role-based framework for supply chain transparency

4.1 Understanding

'Understanding' describes SCT as a role to build internal orientation. It helps internal stakeholders to understand how the organisation's SC is structured and how it functions. From an OIPT perspective, SCT can reduce information processing needs by making SC information more accessible and embedded within the organisation. This might reduce the effort required for internal stakeholders to find and understand SC information.

The study identified three content categories (see Figure 2 for the full list). Firstly, SCT reduces *internal information asymmetries* by making fragmented SC knowledge visible across the organisation. This makes it easier for internal stakeholders to compare results and creates a shared understanding. Secondly, SCT supports the *identification and monitoring of risks* by revealing dependencies, critical nodes, and structural vulnerabilities (among others) in multi-tier supply networks. Thirdly, SCT facilitates *organisational learning* by making inconsistencies between operational reality, strategic intent, and external communication visible.

4.2 Prioritising

'Prioritising' describes SCT as a role that provides decision support to internal stakeholders. Its main objective is to determine where to focus an organisation's attention. From an OIPT perspective, SCT increases the capacity to process information by organising and directing managerial attention towards the most important problem areas. This allows organisations to allocate (scarce) resources more effectively.

The study differentiates between *strategic and operational decision support*. Strategically, SCT breaks down complex, multi-tiered supply networks into smaller, more manageable sub-areas, facilitating prioritisation. This is closely linked to 'Understanding': organisations must first build an understanding of their SC before they can prioritise effectively.

Operationally, SCT can support the alignment and coordination of priorities across departments. This can enhance their capacity to address acute operational issues (e.g. SC disruptions) by clarifying where action is most needed.

4.3 Explaining

'Explaining' describes the communication of SC information to external stakeholders. As these stakeholders have different interests, levels of knowledge and positions of power, organisations must decide which information to disclose to whom. SCT supports this by making the organisation's SC structure and activities transparent and more accessible. From an OIPT perspective, SCT's role in this quadrant is to enhance external stakeholders' ability to process information by reducing ambiguity and scope for interpretation. This makes it easier for them to compare and assess organisations.

The study identified four content categories. Firstly, SCT enables *stakeholder governance*: voluntary disclosure can extend influence beyond organisational boundaries and create a basis for comparability, rankings, and downward standards. Secondly, SCT supports *trust, legitimacy, and reputation* by providing the necessary background information on its ethical intents (whereas non-voluntary transparency can undermine trust). Thirdly, SCT proves *compliance and accountability* by enabling external traceability and communicating regulatory and voluntary requirements. Fourthly, SCT *reduces cognitive complexity* for external stakeholders by mitigating information overload and misinterpretation; in particular, price and cost transparency can increase purchase intentions.

4.4 Signalling

‘Signalling’ describes SCT as a strategic role for managing the perceptions and behaviours of external stakeholders. In this role, SCT functions as a deliberate economic signal with market impact. From an OIPT perspective, SCT primarily increases the capacity to process information at market and network levels by providing credible information that supplements or replaces traditional market signals.

The study identified four content categories. Firstly, SCT *reduces uncertainty* about product quality by signalling organisational quality, thereby mitigating information asymmetries. Disclosing relevant information about suppliers, processes, costs, or quality can reduce uncertainty about product quality. This is often supported by certifications. In doing so, SCT may also contribute to market stabilisation, since it supports more accurate pricing and prevents high-quality suppliers from being displaced by lower-cost, lower-responsibility ones (Akerlof 1970). Secondly, SCT enables *differentiation from competitors*. It creates value by providing additional information and supporting strategic positioning, especially for SMEs. SCT can serve as a distinctive and “hard-to-imitate” resource. Thirdly, SCT *influences power relations* by determining which information is made visible or hidden, and what is deemed relevant. Rather than simply disclosing information neutrally, an organisation may use this deliberately to discipline external stakeholders and redistribute control. Fourthly, SCT can open *opportunities for collaboration*, especially when initiatives start to integrate external stakeholder knowledge.

5 Case Study Findings

It is outlined how CW used SCT to present a more detailed picture of the suggested framework. The findings are structured along the four previously described roles, but vary depending on the insights.

5.1 Understanding at CW

At CW, SCT was used to gain a more detailed internal understanding of their multi-tier SC. For this purpose, an upstream SC map was developed in 2021. After contacting 21 tier-1 suppliers, 41 tier-2 suppliers were identified. However, during the mapping process, only three tier-2 suppliers provided anonymised data on the geographical location and product category of tier-3 suppliers. Despite efforts to achieve deeper visibility, no additional information was obtained. Consequently, 16 anonymous tier-3 suppliers have been identified.

From an *organisational learning perspective*, the mapping process reduced internal information asymmetries by making fragmented SC knowledge visible across their teams. Although this knowledge was already available in principle, visualising it on a map had the positive side effect of making the SCM structure visible to everyone in CW. It also supported *risk identification*. The mapping process revealed critical nodes and structural vulnerabilities in the network. For instance, while most tier-2 suppliers serve only one Tier-1 supplier, a few supply multiple tier-1 suppliers (hidden nodes). Hence, CW developed a better understanding of its SC and began building internal SCM capabilities to better manage upstream risks.

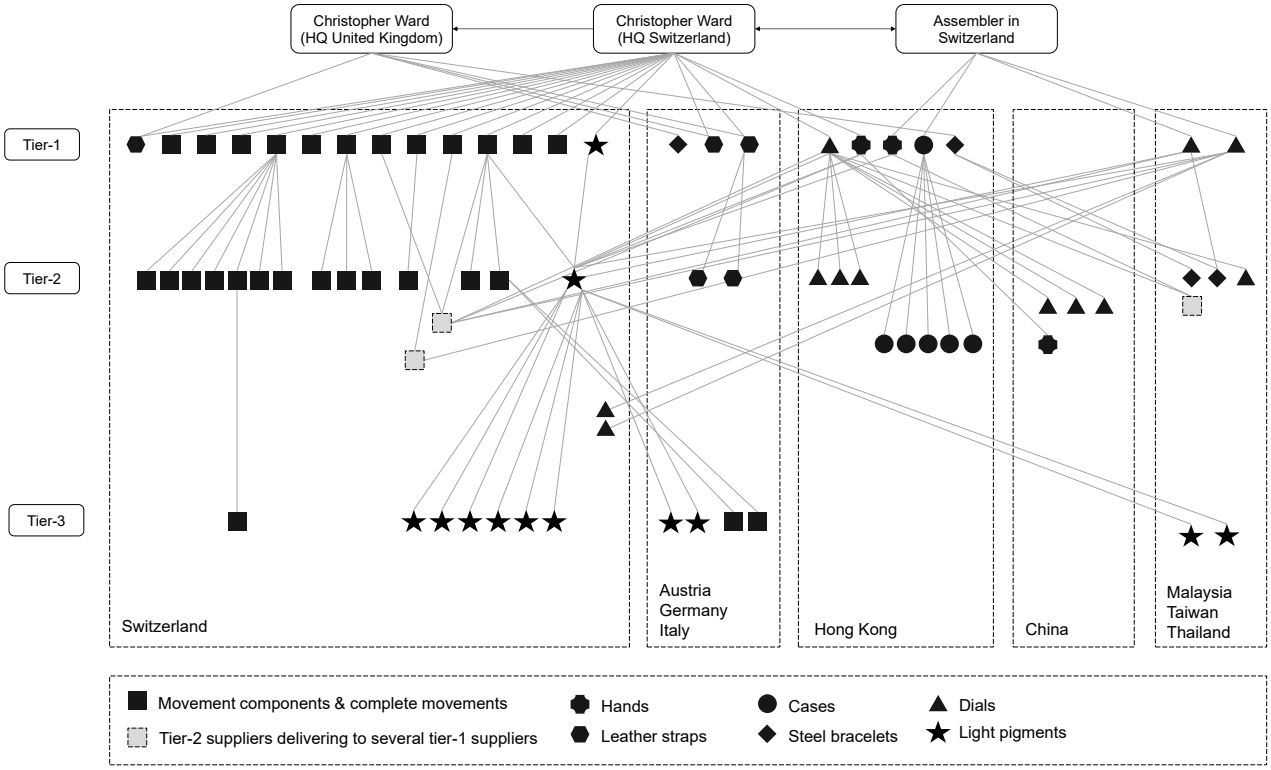


Fig. 4 Christopher Ward's supply chain, mapped down to tier-3 in 2021

5.2 Prioritising at CW

At CW, SCT was used as a decision-support measure for both operational and strategic prioritisation. Operationally, CW developed a set of supplier KPIs to systematically monitor performance and risk across its key suppliers. This revealed that a core supplier of watch cases, which had previously been assessed as performing well, actually performed poorly when assessed in more detail.

From a strategic perspective, SCT informed the redesign of parts of the SC. Due to increasing complexity, CW appointed an SC director in 2024. They began prioritising risk management and implementing a second source for each of its Asian suppliers. CW mainly focused on Thailand for second sourcing. This has now been fully established, and CW intends to apply the same strategy to critical parts within the Swiss market. CW also plans to establish a third source for one selected Thai supplier to mitigate price fluctuations. Overall, CW has concluded that second sourcing strikes the right balance between

efficiency, resilience, and sustainability. They have also ceased working with one dial supplier in Taiwan due to geopolitical tensions. Figure 5 illustrates these changes at the supply network level.

The mapping also made a critical structural dependency visible: a Swiss movement supplier with near-monopoly status and limited alternatives. SCT triggered internal discussions on long-term options to reduce this dependence.

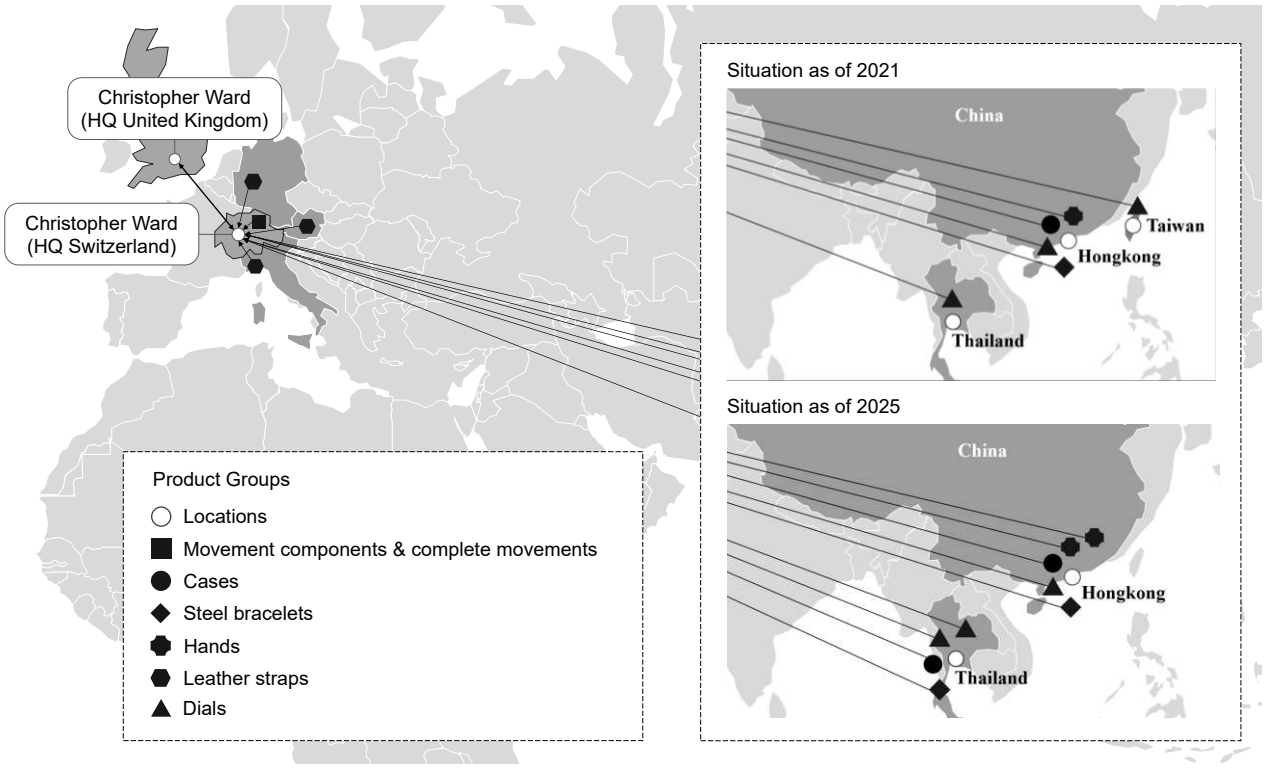


Fig. 5 Christopher Ward's supply network map showing the situation in 2021 and 2025.

5.3 Explaining at CW

CW uses SCT to systematically communicate SC information to external stakeholders. The company mostly relied on two channels: its website and the quarterly journal Loupe, which has been published consistently for over a decade. Each issue features in-depth articles on CW's watches, the SC, suppliers, manufacturing, design, and lifestyle topics.

CW considers price and cost transparency as related to SCT. They introduced their 'three-times rule,' meaning they do not sell their watches for more than three times the cost of manufacturing. This shows how much more expensive established brands are (some of which are up to 34 times the manufacturing cost) and how much they spend on marketing. CW also uses SCT to compare prices directly with well-known brands. For example, they compared one of their models with a model from a traditional brand, and the price difference was over £20,000. CW has also added a 'Do your research' section to its website to encourage (and educate) customers to compare and understand the SC structure and product quality they want to buy.

Secondly, they try to build trust among their customers. This is primarily achieved through their radical provenance. From the outset, CW has included its suppliers in marketing and communication initiatives. They also use other communication approaches, such as discussing the pros and cons of different manufacturing practices or, for instance, explaining openly that they no longer perform specific processes manually but instead use CNC technology to scale production more effectively. As part of this process, new suppliers are announced, which gives customers a better understanding of modern watchmaking. In 2023, to scale one of their most successful products, they announced partnerships with three new suppliers specialising in finishing, CNC and laser manufacturing. From CW's point of view, announcing those suppliers also shows the quality of their partners and that they use the same suppliers as all the 'big players' in the luxury watch segment.

For CW, compliance and responsibility go hand in hand with building trust. A special case is CW's approach of making production errors public (e.g., problems with prototypes). This transparent approach also complements their marketing efforts. CW has also published a statement regarding the UK Modern Slavery Act, which they see as an important step toward building

trust. Especially since they must take a close look to avoid being misled by tier-1 suppliers who are aware of the legal requirements and how to circumvent these laws. Additionally, CW had begun introducing a Supplier Code of Conduct.

Lastly, it is worth considering CW's impact on other stakeholders. Going back to their goal of transparency about both suppliers and prices/cost structures, the CEO of CW has written an open letter to the watch industry, demanding that watchmakers name their suppliers rather than pretending to manufacture certain parts themselves. Impacts are not documented, but it is indeed a special step for a highly competitive industry.

5.4 Signalling at CW

By naming prominent, highly specialised suppliers of movement components and light pigments, for example, CW signals the quality of its watches and proves that its standards are at least equal to those of its more famous competitors. In a highly specialised industry such as watchmaking, top-notch suppliers can signal the highest possible quality. In addition to naming these suppliers, CW also mentions the well-known watch designers who have collaborated with them.

CW was also a founding member of the Alliance of British Watch and Clockmakers. This sent a strong signal of power and expertise to external stakeholders (but not necessarily to suppliers). Until 2023, CW was in a weaker position, but thereafter its power shifted due to strong growth. Through the alliance, CW began sharing data via the KPMG Bellwether Report in 2021. While these signalling effects may not lead to an immediate redistribution of power, they can probably affect it in the long term. As CW experienced, power is also highly dynamic and may change over time.

6 Discussion

This study describes SCT as a set of interconnected roles which evolve differently depending on the audience and purpose. Academic literature is fragmented, focusing either on operational-technical or communication/marketing transparency aspects (Montecchi et al. 2021; Nawaz and Wagner 2025). Within the role-based SCT framework, the study attempted to address this gap from an SME perspective. The aim was to provide an approach that is straightforward and enables the roles to be described in relation to stakeholders, given that SCT involves disclosing information to a recipient (Schäfer 2023).

The study identified four roles of SCT (Understanding, Prioritising, Explaining and Signalling) and illustrated them using a single case study of CW. 'Understanding' is described as the foundational role that creates a shared understanding of the SC within the SME. 'Prioritising' translates this understanding into decisions, enabling the SME to focus its limited resources on a small number of critical areas (e.g. key suppliers). 'Explaining' makes SCT practices understandable to external stakeholders by communicating what the focal company does, why it does so, and where its limits lie. 'Signalling' captures the strategic role of selectively applying SCT to signal quality, competence and power.

The framework distinguishes between internal and external stakeholders (Freeman 1984) and between the two OIPT strategies: 'reducing the need for information processing' and 'increasing the capacity to process information' (Akerlof 1970). This constitutes the main, overarching role of SCT as a strategic resource for processing SC and operations-related information between these stakeholders (Haußmann et al. 2012). However, the roles of SCT are closely linked and often complement each other (Jia et al. 2024). Understanding enables prioritising. Explaining reinforces signalling. The study attempted to illustrate this relationship using the overlapping circles in Figure 3. Overall, the framework indicates that the value of SCT for SMEs stems from the interaction between these roles. Rather than maximising transparency in general, SMEs may find it more beneficial to use SCT selectively and strategically across the suggested roles.

Based on the study's findings, three propositions for future validation have been formulated. Firstly, the CW case indicated that trust arises less from the quantity or perfection of the information disclosed and more from a willingness to communicate honestly and to acknowledge vulnerabilities (e.g., mistakes, margins and trade-offs). In CW's case, disclosure is complemented by suppliers' involvement in marketing initiatives. Hence, in line with Mollenkopf et al. (2022), it is suggested that all signals sent by SMEs must be consistent with overall corporate actions to avoid being perceived as hypocritical. Based on this observation, *Proposition A* is suggested: In SMEs, the trust-building effect of SCT depends less on the completeness or formalisation of disclosed information, and more on the voluntary and authentic disclosure of sensitive information.

Secondly, SCT could be used to shift power relations within the network due to its signalling effect. While large enterprises often introduce SCT for 'symbolic' purposes and are concerned with compliance issues, SMEs could gain a 'David versus Goliath' advantage through radical yet strategically planned SCT. This could turn the Davids' sympathy into a competitive advantage. In the case of CW, because of their goal of challenging the (too high) margins of famous luxury brands, they had to be transparent about their own operations and pricing. This has generated sympathy among customers. Large corporations often fail to achieve this level of sympathy. Therefore, SCT not only has a neutral informational role but also has the potential to discipline other entities. Based on this observation, *Proposition B* is suggested: By using selective SCT, SMEs can partially offset structural power imbalances within supply networks and gain a competitive advantage over larger competitors.

Thirdly, a close link emerges between the 'Explaining' and 'Signalling' roles. Based on 'market for lemons' (Akerlof 1970), it can be argued that SCT is important in legitimising value in situations where marketing-induced price premiums are high. In particular, the actual manufacturing price of consumer goods is often obscured by marketing, making it difficult for consumers to assess quality differences. In the case of CW, they use price transparency to differentiate themselves from well-known brands. For SMEs with limited marketing budgets, SCT could therefore serve as a substitute for costly marketing campaigns by more efficiently reducing information asymmetry. Based on this observation, *Proposition C* is suggested: In branding-intensive, quality-uncertain B2C markets, SMEs with limited marketing budgets can use SCT to replace traditional market signals, such as branding and advertising, by providing credible information that confirms value and quality.

6.1 Theoretical Implications

This study extends existing theories in two ways. Firstly, the study contributes to the debate on SCT and its implications for SMEs. Much of the existing research focuses on SCT as a technical capability, such as visibility, traceability and data integration, combined with disclosure practices (Montecchi et al. 2021). The main objective is to achieve legitimacy, compliance or respond to stakeholder pressure within larger enterprises (Zhao et al. 2025). These perspectives may implicitly assume that greater transparency or more advanced transparency technologies lead to better outcomes. This study challenges

this assumption, arguing that the strategic value of SCT for SMEs does not lie in the extent of disclosure, but in the combination of the specific SCT roles at a given point in time.

Secondly, the study expands the scope of OIPT within the SCM literature. Traditionally, OIPT has been used to explain how companies address complexity and uncertainty by investing in IT infrastructure, analytics and digital technologies (Haußmann et al. 2012; Zhu et al. 2018). Recent reviews (Yang et al. 2025) have described how OIPT-based SCM research has mainly associated increased information processing capacity with technologies such as IoT, artificial intelligence, and blockchain. This study builds on this by proposing that OIPT can also be used to analyse strategic information design choices, even in the absence of advanced digital systems.

6.2 Managerial Implications

Unlike large corporations, SMEs are less restricted by regulatory reporting requirements, which might give them the opportunity to be more selective and purposeful in their transparency initiatives.

Firstly, the study recommends that SMEs could identify an 'SCT sweet spot'. This involves having the courage to leave gaps, since achieving complete end-to-end transparency is often neither technically feasible nor economically viable. Instead, SCT should be designed selectively, focusing on those SC elements where transparency generates the highest strategic return. Using the role-based framework, managers can assess whether an SCT initiative primarily supports internal orientation (understanding), resource allocation (prioritisation), stakeholder communication (explaining) or market positioning (signalling). These roles have the greatest impact when deliberately combined rather than pursued in isolation.

Secondly, the study recommends considering SCT as a possible substitute for traditional marketing activities. In quality-uncertain, branding-intensive markets, SMEs with limited marketing budgets could use SCT to compete with major brands' marketing resources. Rather than investing heavily in branding campaigns, honestly disclosing SC and cost structures could be an effective way to reduce information asymmetry with customers and communicate quality, which larger competitors might find more difficult to imitate without undermining their existing branding logic.

Thirdly, the study recommends that managers ensure consistency of the SCT initiative across the business model (Trkman et al. 2015). If transparency is not integrated into the entire business model, its effects evaporate or backfire (Mollenkopf et al. 2022). Inconsistent signals, such as claiming transparency while concealing known errors, incur penalties from consumers. Hence, managers should understand how to connect and embed SCT within all parts of their business model.

7 Conclusion

Both research and practice 16pecializ SCT as a key aspect of complying with regulations and meeting the growing demand to implement sustainability (Duan et al. 2021). This study explored the potential applications of SCT from a strategic perspective. Through qualitative content analysis and a case study of Swiss-British watchmaker Christopher Ward, the study developed a role-based framework for SCT grounded in stakeholder theory and OIPT. Reflecting on the research question, it is possible to conclude that SCT can fulfil four strategic roles: 'Understanding', 'Prioritising', 'Explaining' and 'Signalling'. When combined effectively, these roles could give SMEs a competitive advantage in competitive B2C markets.

The primary benefit of SCT for SMEs lies not in achieving maximum end-to-end transparency, but in identifying an optimal 'sweet spot' across all four roles. The CW case also showed that visibility might reach a limit for SMEs at tier-2. From this perspective, this limitation should be viewed not as a weakness but as an opportunity to consider how transparency could be 16peciali for purposes beyond mere disclosure.

Reflecting on the signalling role of SCT, the study concludes that SMEs could experience the so-called 'David versus Goliath' effect. While large corporations often rely on compliance-driven, symbolic transparency and focus on internal traceability and visibility to manage complexity, SMEs can leverage SCT to potentially gain a competitive advantage. By making their professional partnerships, quality standards and cost structures visible, SMEs could challenge the narratives of dominant markets and achieve sympathy that larger competitors would find difficult to imitate.

The study has limitations. First, the method of this study is based solely on a qualitative content analysis and a single-case study. The results cannot be 16pecialized or transferred to other companies or industries, since the CW case does not reflect the breadth of the SME landscape. The watch industry is 16pecialized16d by a highly 16pecialized SC and unique branding strategies. In industries with lower margins or pure B2B commodity markets, however, the roles of SCT could differ significantly. Furthermore, the case served only to illustrate a conceptual framework. As the study has not yet undergone empirical validation, it is based solely on theory and, at best, indicates possible research avenues.

In terms of conceptual limitations, the decision to focus on Galbraith's OIPT (1974) and two specific axes (internal/external stakeholders and information logic) may exclude other relevant theoretical perspectives. The division of roles into four quadrants is subjective and lacks clarity. In reality, the four roles are closely intertwined and are neither mutually exclusive nor collectively exhaustive. Additionally, while the study uses the term 'transparency' (SCT) also for internal stakeholders, 'visibility' is a more common term in academia on internal processes, which is a conceptual weakness. Furthermore, the study only analysed CW's customers' perceptions to a very limited extent. As value always comes from customers, it is important to expand on customer perspectives.

In addition to the propositions, future research could test and further develop the role-based framework using multiple case studies. Firstly, the research could be extended to other competitive B2C industries, such as cosmetics or fashion. Alternatively, it could investigate how the roles might function in less consumer-driven B2B markets. Secondly, it would be interesting to investigate the main barriers that SMEs face when transitioning from data collection to the strategic use of SCT. Thirdly, it would be promising to research whether disclosing issues along the SC is correlated with increased customer loyalty and whether there is a limit to fallibility beyond which transparency damages trust rather than strengthening it. Fourthly, given the current uncertainty surrounding the quantification of SCT investments relative to traditional marketing expenditures, it would be valuable to explore whether this can be leveraged to support the proposition that high-quality, effective sustainability in the SC can generate new competitive advantages under the premise of transparency.

Although this paper focuses on the narrow field of SCT, considering the underlying mechanisms could be crucial for addressing ecological crises and social inequalities (Richardson et al. 2023). The study concludes that SMEs can use this opportunity to challenge larger companies and explore transformations towards more sustainable business practices.

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Informed Consent Declaration

All participants provided informed verbal consent before taking part in the study. Written consent was not obtained as the workshops/interviews were informal and exploratory. No identifiable personal data has been included. Christopher Ward was given the manuscript before submission and granted permission for publication.

Declaration of Interest

The authors declare that no competing interests have influenced the outcomes or interpretations of this study.

Use of AI Technology

During the preparation of this work, the authors used NotebookLM to partly review the literature, as well as ChatGPT 5.2 to support the accuracy of the coding procedure for the qualitative content analysis. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Submission Declaration

The work has not been published previously and is not under consideration for publication elsewhere.

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Data Statement

The data collected/structured from the literature and used for the qualitative content analysis are accessible on Mendeley Data. Due to the sensitive nature of the interviews/workshops, Christopher Ward was assured that raw data would remain confidential and would not be shared.

Author Contributions

Marcel Jaun: Conceptualisation, Investigation, Formal Analysis, Writing (Original Draft). **Jörg H. Grimm:** Supervision, Writing (Reviewing and Editing).

References

Akerlof GA (1970) The market for “lemons”: Quality uncertainty and the market mechanism. Q J Econ 84:488–500. https://doi.org/10.2307/1879431

Bagwell K (2007) The economic analysis of advertising. In: Armstrong M, Porter R (eds) Handbook of industrial organization, vol 3. Elsevier, Amsterdam, pp 1701–1844. https://doi.org/10.1016/S1573-448X(06)03028-7

Baik B, Even-Tov O, Han R and Park D (2024) The real effects of supply chain transparency regulation: Evidence from Section 1502 of the Dodd–Frank Act. J Account Res 62:551–587. https://doi.org/10.1111/1475-679X.12530

Baker WE and Sinkula JM (2005) Market orientation and the new product paradox. J Prod Innov Manag 22:483–502. https://doi.org/10.1111/j.1540-5885.2005.00145.x

Bar-Isaac H and Tadelis S (2008) Seller reputation. Foundations and Trends® in Microeconomics 4:273–351. https://doi.org/10.1561/0700000027

Bergh DD, Connelly BL, Ketchen DJ Jr and Shannon LM (2014) Signalling theory and equilibrium in strategic management research: An assessment and a research agenda. J Manag Stud 51:1334–1360. https://doi.org/10.1111/joms.12097

Bernstein ES (2012) The transparency paradox: A role for privacy in organizational learning and operational control. Adm Sci Q 57:181–216. https://doi.org/10.1177/0001839212453028

Budler M, Quiroga BF and Trkman P (2024) A review of supply chain transparency research: Antecedents, technologies, types, and outcomes. J Bus Logist 45:e12368. https://doi.org/10.1111/jbl.12368

Busse C, Schleper MC, Weilenmann J and Wagner SM (2017) Extending the supply chain visibility boundary: Utilizing stakeholders for identifying supply chain sustainability risks. Int J Phys Distrib Logist Manag 47:18–40. https://doi.org/10.1108/IJPDLM-02-2015-0043

Carlos WC and Lewis BW (2018) Strategic silence: Withholding certification status as a hypocrisy avoidance tactic. Adm Sci Q 63:130–169. https://doi.org/10.1177/0001839217695089

Clarkson MBE (1995) A stakeholder framework for analyzing and evaluating corporate social performance. Acad Manag Rev 20:92–117. https://doi.org/10.2307/258888

Connelly BL, Certo ST, Reutzel CR, DesJardine MR and Zhou YS (2024) Signaling theory: State of the theory and its future. J Manag 51:24–61. https://doi.org/10.1177/01492063241268459

Delgado F, Garrido S and Bezerra BS (2025) Barriers to visibility in supply chains: Challenges and opportunities of artificial intelligence driven by Industry 4.0 technologies. Sustainability 17:2998. https://doi.org/10.3390/su17072998

Duan Y, Hofer C and Aloysius JA (2021) Consumers care and firms should too: On the benefits of disclosing supplier monitoring activities. J Oper Manag 67:360–381. https://doi.org/10.1002/joom.1129

Egels-Zandén N and Hansson N (2016) Supply chain transparency as a consumer or corporate tool: The case of Nudie Jeans Co. J Consum Policy 39:377–395. https://doi.org/10.1007/s10603-015-9283-7

Eggers F (2020) Masters of disasters? Challenges and opportunities for SMEs in times of crisis. J Bus Res 116:199–208. https://doi.org/10.1016/j.jbusres.2020.05.025

Ergene S, Banerjee SB and Hoffman AJ (2021) (Un)sustainability and organization studies: Towards a radical engagement. Organ Stud 42:1319–1335. https://doi.org/10.1177/0170840620937892

Fassin Y (2009) The stakeholder model refined. J Bus Ethics 84:113–135. https://doi.org/10.1007/s10551-008-9677-4

Flyverbom M, Christensen LT and Hansen HK (2015) The transparency–power nexus. Manag Commun Q 29:385–410. https://doi.org/10.1177/0893318915593116

Fraser IJ, Müller M and Schwarzkopf J (2020) Transparency for multi-tier sustainable supply chain management: A case study of a multi-tier transparency approach for SSCM in the automotive industry. Sustainability 12:1814. https://doi.org/10.3390/su12051814

Freeman RE (1984) Strategic management: A stakeholder approach. Pitman, Boston

Galbraith JR (1974) Organization design: An information processing view. Interfaces 4:28–36. http://www.jstor.org/stable/25059090

Geissdoerfer M, Morioka SN, de Carvalho MM and Evans S (2018) Business models and supply chains for the circular economy. J Clean Prod 190:712–721. https://doi.org/10.1016/j.jclepro.2018.04.159

Gold S and Heikkurinen P (2018) Transparency fallacy: Unintended consequences of stakeholder claims on responsibility in supply chains. Account Audit Account J 31:318–337. https://doi.org/10.1108/AAAJ-06-2015-2088

Gualandris J, Longoni A, Luzzini D and Pagell M (2021) The association between supply chain structure and transparency: A large-scale empirical study. J Oper Manag 67:803–827. https://doi.org/10.1002/joom.1150

Haack P, Schoeneborn D and Wickert C (2012) Talking the talk, moral entrapment, creeping commitment? Exploring narrative dynamics in corporate responsibility standardization. Organ Stud 33:815–845. https://doi.org/10.1177/0170840612443630

Hahn R and Kühnen M (2013) Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. J Clean Prod 59:5–21. https://doi.org/10.1016/j.jclepro.2013.07.005

Haußmann C, Dwivedi YK, Venkitachalam K and Williams MD (2012) A summary and review of Galbraith's organizational information processing theory. In: Dwivedi YK, Wade M and Schneberger S (eds) Information systems theory. Integrated Series in Information Systems, vol 29. Springer, New York, pp 71–93. https://doi.org/10.1007/978-1-4419-9707-4_5

Hillary R (2004) Environmental management systems and the smaller enterprise. J Clean Prod 12:561–569. https://doi.org/10.1016/j.jclepro.2003.08.006

Iranmanesh M, Maroufkhani P, Asadi S, Ghobakhloo M, Dwivedi YK and Tseng M-L (2023) Effects of supply chain transparency, alignment, adaptability, and agility on blockchain adoption in supply chain among SMEs. Comput Ind Eng 176:108931. https://doi.org/10.1016/j.cie.2022.108931

Jaun, M. and Grimm, J.H. (2026) Coding table: Role-based framework for SCT. Mendeley Data, V1. https://doi.org/10.17632/rw3vxppdbs.1

Jia F, Seuring S, Chen L and Azadegan A (2024) Guest editorial: Supply chain transparency: Opportunities, challenges and risks. Int J Oper Prod Manag 44:1525–1538. https://doi.org/10.1108/IJOPM-09-2024-992

Kessler AS (2001) Revisiting the lemons market. Int Econ Rev 42:25–41. https://doi.org/10.1111/1468-2354.00099

Kim K and Kim SH (2019) Selling a lemon under demand uncertainty. Int Econ Rev 60:75–103. https://doi.org/10.1111/iere.12345

Kirmani A and Rao AR (2000) No pain, no gain: A critical review of the literature on signaling unobservable product quality. J Mark 64:66–79. https://doi.org/10.1509/jmkg.64.2.66.18000

Levi-Faur D (2005) The global diffusion of regulatory capitalism. Ann Am Acad Pol Soc Sci 598:12–32. https://doi.org/10.1177/0002716204272371

Liu Y, Du J and Kang T (2024) Establishing supply chain transparency and its impact on supply chain risk management and resilience. Oper Manag Res 17:1157–1171. https://doi.org/10.1007/s12063-024-00499-9

Mahajan R, Lim WM, Sareen M, Kumar S and Panwar R (2023) Stakeholder theory. J Bus Res 166:114104. https://doi.org/10.1016/j.jbusres.2023.114104

Mamada R (2022) The market for lemons and information theory. Math Soc Sci 120:107–112. https://doi.org/10.1016/j.mathsocsci.2022.10.002

Mayring P and Fenzl T (2019) Qualitative Inhaltsanalyse. In: Baur N and Blasius J (eds) Handbuch Methoden der empirischen Sozialforschung. Springer VS, Wiesbaden. https://doi.org/10.1007/978-3-658-21308-4_42

Meixell MJ and Luoma P (2015) Stakeholder pressure in sustainable supply chain management: A systematic review. Int J Phys Distrib Logist Manag 45:69–89. https://doi.org/10.1108/IJPDLM-05-2013-0155

Michelon G, Pilonato S and Ricceri F (2015) CSR reporting practices and the quality of disclosure: An empirical analysis. Crit Perspect Account 33:59–78. https://doi.org/10.1016/j.cpa.2014.10.003

Minami C, Nishioka K and Dawson J (2012) Information transparency in SME network relationships: Evidence from a Japanese hosiery firm. Int J Logist Res Appl 15:405–423. https://doi.org/10.1080/13675567.2012.749848

Mol APJ (2015) Transparency and value chain sustainability. J Clean Prod 107:154–161. https://doi.org/10.1016/j.jclepro.2013.11.012

Mollenkopf DA, Peinkofer ST and Chu Y (2022) Supply chain transparency: Consumer reactions to incongruent signals. J Oper Manag 68:306–327. https://doi.org/10.1002/joom.1180

Montecchi M, Plangger K and West DC (2021) Supply chain transparency: A bibliometric review and research agenda. Int J Prod Econ 238:108152. https://doi.org/10.1016/j.ijpe.2021.108152

Morgan TR, Gabler CB and Manhart PS (2023) Supply chain transparency: Theoretical perspectives for future research. Int J Logist Manag 34:1422–1445. https://doi.org/10.1108/IJLM-02-2021-0115

Nawaz RR and Wagner R (2025) Disclosing transparency: A review of B2B marketing and supply chain research. Ind Mark Manag 124:73–94. https://doi.org/10.1016/j.indmarman.2024.11.011

Niedenzu D, Kumar M, Tsolakis N and Dora M (2019) Digitalisation of supply chains: An information processing perspective. In: Proceedings of the 25th Annual EurOMA Conference, Budapest, Hungary. https://doi.org/10.17863/CAM.35116

Pinnington B, Benstead A and Meehan J (2023) Transparency in supply chains (TISC): Assessing and improving the quality of modern slavery statements. J Bus Ethics 182:619–636. https://doi.org/10.1007/s10551-022-05037-w

Raja P and Mohan U (2025) A conceptual framework proposed through literature review to determine the dimensions of social transparency in global supply chains. Manag Rev Q 75:2515–2542. https://doi.org/10.1007/s11301-024-00440-1

Richardson K, Steffen W, Lucht W, Bendtsen J, Cornell SE, Donges JF, Drüke M, Fetzer I, Bala G, von Bloh W and Feulner G (2023) Earth beyond six of nine planetary boundaries. Sci Adv 9:eadh2458. https://doi.org/10.1126/sciadv.adh2458

Savimäki E, Hallikainen H, Gabrielsson M and Laukkanen T (2025) Big data driven supply chains in SMEs: The role of industry digitalization. J Small Bus Manag 1–24. https://doi.org/10.1080/00472778.2025.2578448

Schäfer N (2023) Making transparency transparent: A systematic literature review to define and frame supply chain transparency in the context of sustainability. Manag Rev Q 73:579–604. https://doi.org/10.1007/s11301-021-00252-7

Schaëfer K, Kähkönen A and Luzzini D (2025) Traceability in multi-tier supply chains: Insights from five case studies. Supply Chain Manag 30:77–99. https://doi.org/10.1108/SCM-07-2024-0428

Schlagwein D, Conboy K, Feller J, Leimeister JM and Morgan L (2017) "Openness" with and without information technology: A framework and a brief history. J Inf Technol 32:297–305. https://doi.org/10.1057/s41265-017-0049-3

Septianto F, Kemper JA, Tjiptono F et al (2021) The role of authentic (vs. hubristic) pride in leveraging the effectiveness of cost transparency. J Bus Ethics 174:423–439. https://doi.org/10.1007/s10551-020-04613-2

Sodhi MS and Tang CS (2019) Research opportunities in supply chain transparency. Prod Oper Manag 28:2946–2959. https://doi.org/10.1111/poms.13115

Soundararajan V and Brown JA (2016) Voluntary governance mechanisms in global supply chains: Beyond CSR to a stakeholder utility perspective. J Bus Ethics 134:83–102. https://doi.org/10.1007/s10551-014-2418-y

Spence M (1973) Job market signaling. Q J Econ 87:355–374. https://doi.org/10.2307/1882010

Srinivasan R and Swink M (2015) Leveraging supply chain integration through planning comprehensiveness: An organizational information processing theory perspective. Decis Sci 46:823–861. https://doi.org/10.1111/deci.12166

Suchman MC (1995) Managing legitimacy: Strategic and institutional approaches. Acad Manag Rev 20:571–610. https://doi.org/10.2307/258788

Swink M, Sant'Ana Gallo I, Defee C and Lago da Silva A (2024) Supply chain visibility types and contextual characteristics: A literature-based synthesis. J Bus Logist 45:e12366. https://doi.org/10.1111/jbl.12366

Trkman P, Budler M and Groznik A (2015) A business model approach to supply chain management. Supply Chain Manag 20:587–602. https://doi.org/10.1108/SCM-06-2015-0219

Villena VH, Wilhelm M and Xiao C-Y (2021) Untangling drivers for supplier environmental and social responsibility: An investigation in Philips Lighting's Chinese supply chain. J Oper Manag 67:476–510. https://doi.org/10.1002/joom.1131

Wang Q, Xu X and Wang Y (2024) The impact of supply chain strategy on supply chain transparency over the firm lifecycle: Evidence from China. Int J Oper Prod Manag 44:1539–1567. https://doi.org/10.1108/IJOPM-07-2023-0571

Wilhelm M, Blome C, Wieck E and Xiao CY (2016) Implementing sustainability in multi-tier supply chains: Strategies and contingencies in managing sub-suppliers. Int J Prod Econ 182:196–212. https://doi.org/10.1016/j.ijpe.2016.08.006

Wong CWY, Lirn T-C, Yang C-C and Shang K-C (2020) Supply chain and external conditions under which supply chain resilience pays: An organizational information processing theorization. Int J Prod Econ 226:107610. https://doi.org/10.1016/j.ijpe.2019.107610

Yang Y, Abd Rahman A, Abdan K, Aziz Abdul Y and Li Y (2025) The application of organizational information processing theory in supply chain management strategy research: A bibliometric review. Corp Bus Strategy Rev 6:378–391. https://doi.org/10.22495/cbsrv6i1siart14

Yang L and Lu L (2025) Improving supply chain transparency: From the perspective of suppliers. Ann Oper Res 350:1331–1362. https://doi.org/10.1007/s10479-024-06009-1

Zhao Y, Wu W, Shen Z and Ji Z (2025) Supply chain transparency and firm performance: The role of customer trust. Finance Res Lett 85:107880. https://doi.org/10.1016/j.frl.2025.107880

Zheng LJ, Islam N, Zhang JZ, Wang H and Au KMA (2024) How does supply chain transparency influence idiosyncratic risk in newly public firms: The moderating role of firm digitalization. Int J Oper Prod Manag 44:1649–1675. https://doi.org/10.1108/IJOPM-08-2023-0689

Zhu S, Song J, Hazen BT, Lee K and Cegielski C (2018) How supply chain analytics enables operational supply chain transparency: An organizational information processing theory perspective. Int J Phys Distrib Logist Manag 48:47–68. https://doi.org/10.1108/IJPDLM-11-2017-0341