

Supply chain transparency and traceability in the textile and apparel industry: A qualitative approach to defining them and identifying the adoption reasons

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Introduction and Purpose. For sustainable supply chains, transparency and traceability are important topics in the textile and apparel industry (TAI). An example of transparency is H&M's revelation of manufacturers' information to their consumers. ASKET allows consumers to trace from farm to final garment (Bari & Jin, 2022), which is an example of traceability. While transparency and traceability are discussed with sustainability, their definitions and relations with each other remain unclear. Some researchers view traceability as a necessary condition for transparency (Garcia-Torres et al., 2019) while others hold an opposing view that transparency contributes to traceability by reducing information asymmetry (Egels-Zandén et al., 2015). This lack of conceptual clarity is problematic because it hinders academic advancement. Further, little is known about companies' motivation to adopt transparency and traceability. Identifying the motivation can help researchers better align their research with industry needs, offer practical recommendations, and foster collaborations with industry partners. This study investigates how companies define and perceive transparency and traceability with sustainability and their motivation to adopt them.

Literature Review. Transparency is the disclosure of information (Egels-Zandén et al., 2015), while traceability is the ability to identify and trace product history, distribution, location, and application (ISO, 2000). However, these definitions vary among researchers, with some equating transparency to traceability (Laudal, 2010), and others seeing traceability as a dimension of transparency (Egels-Zandén et al., 2015). In adopting transparency and traceability, companies can be influenced by various forces (e.g., regulations, and consumer pressure). In a government-influenced example, the US Customs and Border Protection issued Withhold Release Order (WRO) to remove forced labor, and as a result, Uniqlo shirts were seized (Chua, 2021). However, few studies have investigated companies' motivations to adopt transparency and traceability except for Agrawal & Pal (2019). They identified 14 factors but those were mostly companies' internal factors focusing only on traceability.

Method. In-depth interviews with U.S. textile and apparel company executives were conducted. Eight companies, that have adopted a certain extent of transparency and traceability, were selected. One or two participants from each company were recruited, utilizing a snowball sampling method, and a total of 11 participants were interviewed. Data were collected via zoom conferencing with semi-structured open-ended questions. Examples of questions include: "Within the context of sustainability, in your supply chain, what is the role of transparency and how is it operationalized?", "What is the role of traceability and how do you define it?", "What motivated your company to adopt transparency and/or traceability?" The duration of the interviews was 20-30 minutes. The data were first transcribed and then coded and analyzed using NVivo 12. Later, those codes were checked and revised for consistency, by two researchers, to increase the reliability of the coding schemes.

Results. This study discovered that transparency and traceability were two distinct topics (six responses were obtained to prove this). The following quote endorsed this theme: *“I think these are completely different concepts. Traceability is your ability to identify back into your supply chain, and transparency is what you choose to disclose about those traceability efforts. I think that these are two completely distinct concepts. Often, work together, but they're very distinct, they would be almost very different concepts.”*

As far as the relationship between transparency and traceability is concerned, it was found that transparency depends on traceability, e.g., *“To our company, traceability is more like capability. So, one is how capable you are in tracing your supply chain and knowing your supply chain; to me that it's traceability, [...]. When you are done with this traceability thing, here comes transparency. [...].”* Findings also revealed that sustainability is a big theme, and transparency and traceability are part of sustainability. The following statements supported it: *“Sustainability is a big umbrella. But I would say it's important again, any claims you are making or anything you are saying to be able to back those up. So, traceability and transparency allow us to validate anything [...]so, I think that all relate to our overall sustainability efforts. Don't think you'd be a sustainable brand without those two components.”*

Motivational factors, for adopting transparency and traceability, were found to differ. For transparency, external factors (e.g., consumers, various associations, and regulations) had a higher impact than internal factors (e.g., self-motivation). Consumers placed increasing pressure on companies to disclose the supply chain (nine participants acknowledged this). A supporting quote for this finding is: *“I think we feel like, one of the things consumers want to know about where the product is made.”* Various associations (e.g., Fair Labor Association) motivated companies through membership requirements and ratings (eight responses were found in this regard). The supporting quote is: *“We are part of the Fair Labor Association; they expect us to list our supply chain. There is the Transparency Pledge, [...] There are people at Open Apparel Registry [...]. So many groups are doing this kind of work, [...].”* Regulatory forces had less influence (six responses) than other external factors. The supporting quote is: *“As far as government requirement, I think we are just starting to see how that is affecting us. We adopted ecotex testing several years ago, which can also help with proposition 65 requirements, so I guess you could say that is an influence. But ultimately, like the bills that are coming out now, the European Green Acts and New York fashion bill, I think those are the new bills emerging.”* Only a few companies were motivated to adopt transparency due to internal factors (two responses were obtained).

In contrast, traceability was mostly adopted for internal reasons, such as authenticating sustainability/product claims and identifying supply chain risks (10 responses were found). *“To make sure that what we're paying for is happening, but then, also for the consumers if a consumer questions like, how do you know this is happening. We want to be able to have evidence to back it up and not be guilty of false claims and make sure that even just to ensure that the customer is getting what they're paying for and also what we're paying for is the truth and happening.”* Among the external factors, regulations (e.g., withhold release orders, and modern slavery acts) had greater impacts than consumers and various associations. *“Traceability is a combination of the regulatory environment that comes from a grave human rights issue of what's happening in Xingjian. The regulatory pressures because of this human rights issue kind of like ramped it up and made the efforts kind of moved more quickly [...], people were working on it increased after WRO.”* Consumers had minimal influence on traceability adoption, compared to transparency (one response).

Discussion and Conclusion. This study discovered transparency and traceability as distinct topics, where traceability is the company's ability to know its supply chain, and



Figure 1. Relationship among sustainability, transparency, and traceability

transparency is the disclosure of information that depends on companies' internal decisions and other factors (e.g., consumer demand,

traceability). This is one of the main contributions of this study since previous studies often treated traceability as a component of transparency (Egels-Zandén et al., 2015; Garcia-Torres et al., 2019). The study also clarified the relationships among sustainability, transparency, and traceability (see Figure 1) providing a fundamental understanding of the interrelated concepts. Another important addition to the literature is the discovery of different forces that motivate companies to adopt transparency and traceability. For transparency adoption, external factors (consumer and association pressure) were important, while for traceability, internal factors (authenticating sustainability/product claims) motivated its adoption. This is because the goals of transparency and traceability are fundamentally different. Transparency aims to meet external stakeholder demands whereas traceability primarily fulfills the company's needs and external demands (regulations). Academically, the findings of this study add new knowledge to the literature, and the identified motivational factors can be used as variables for a future quantitative study. The findings also help policymakers and governments develop an appropriate policy for the implementation of transparency and traceability.

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