

Exploring Traceability for Sustainable Apparel Value Chain: Insights from Multiple Cases

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Introduction and Purpose

The dynamic and complex apparel supply chain (SC) poses several social and environmental risks such as inhuman working conditions, water pollution, etc. (Bari & Park-Poaps, 2020; Stevenson & Cole, 2018). In response, different stakeholders have started pressuring apparel companies to make their SCs transparent (Garcia-Torres et al., 2019). Traceability—“the ability to identify and trace the history, distribution, location, and application of products, parts, materials, and services (ISO, 2000)—is a key interest of apparel companies (Agrawal et al., 2021); however, these companies’ manner of implementing traceability has largely remained unknown. Compared to other industries such as food, the apparel industry lacks a common traceability standard (Garcia-Torres et al., 2019). This necessitates uncovering the existing practices of companies. Addressing this research gap, we aim to explore three research questions: (1) which traceability information for sustainability is disclosed to consumers; (2) how it is disclosed; and (3) what technologies are utilized to disclose it. Based on the traceability information by Agrawal and Pal (2019) and following the case study approach, we analyzed data collected from the websites of 10 incumbent and 10 start-ups apparel brands. Start-ups are used selected as some start-ups are leading traceability efforts. Comparing the two can offer critical insights into the status of traceability.

Literature Review

Discussions on traceability in the apparel industry are largely conceptual. Garcia-Torres et al. (2019) developed a conceptual framework for traceability for sustainability based on an integrative and systematic review of 89 peer-reviewed articles from various fields. Some technology-based frameworks—blockchain-based (e.g., Agrawal et al., 2021) and secured-tag-based frameworks (e.g., Agrawal et al., 2018)—have also been developed. Agrawal and Pal (2019) identified 19 vital traceability information sets that companies share with stakeholders. However, few studies have analyzed apparel companies’ SC traceability (Agrawal & Pal, 2019).

Method

Given the dearth of empirical studies on SC traceability in the apparel industry, a case study approach can offer creative insights (Egels-Zandén et al., 2015). Our multiple case study design helps increase the findings’ generalizability analytically. For the incumbent brands, the top 10 transparent brands (e.g., H&M, C&A, Adidas, Esprit, M&S, Patagonia, The North Face, Puma, ASOS, and Nike) ranked by fashion revolution were selected (Fashion Revolution, 2021). For the start-up brands, ASKET, Everlane, Bonobos, Reformation, Amour Vert, People Tree, Pact, Alternative, Tentree, and All American Clothing Co were chosen by a Google search using the keywords “traceability practices by start-ups and new sustainable apparel brands.” Our google search returned a list of start-ups. These 10 brands were chosen as more information on traceability implementation was available on their websites. We collected data from the websites,

annual report (e.g., traceability, sustainability etc.), and sustainability interactive map of these companies.

Results

Regarding *RQ#1*, we analyzed the basic information (e.g., name, address) of all suppliers (e.g., tier 1: apparel manufacturers; tier 2: weaving/knitting, dyeing mills; tier 3: spinning mills; tier 4: raw material suppliers) of brands. All 10 incumbent brands disclosed the names, addresses, and number of workers of tier 1 suppliers, 9 disclosed those of tier 2 suppliers, 6 those of tier 3 suppliers, and only 2 did those of tier 4 suppliers. None, however, disclosed their suppliers' average salary and work hours—data critical for ensuring ethical working conditions and living wages. Compared to incumbent, few start-ups disclosed their suppliers' name, address, and number of workers across all tiers. However, some start-ups such as ASKET are ahead in disclosing work hours and salary than that of incumbent brands (Table 1).

Table 1 Results

	RQ#1 Which information for sustainability is disclosed to consumers?										RQ#2 How it is disclosed?			RQ#3 What technologies are utilized to disclose it?		
	Tier 1 supplier (apparel manufacturers)			Tier 2 (weaving/knitting, dyeing mills)			Tier 3 (spinning mills)			Tier 4 (Raw materials)	Via online or app with each product	Report or excel sheet.	Interactive map	Blockchain	RFID	Tags/Barcodes
	Name and address	No. of workers	Work hrs. and salary	Name and address	No. of workers	Work hrs. and salary	Name and address	No. of workers	Work hrs. and salary	Origin and certification (e.g., organic, BCI)						
Incumbent (n=10)	10	10	0	9	9	0	6	6	0	2	1	10	4	1	0	0
Start-ups (n=10)	7	5	2	3	1	1	3	1	1	2	3	2	3	0	0	1

Regarding *RQ#2*, we observed that apparel companies use three modes to disclose traceability information: (1) online or company apps for each product; (2) sustainability reports or excel sheets; (3) and interactive maps. Three start-ups, compared to one incumbent, disclosed the information via online or company apps at the individual product level. Also, all 10 incumbent brands disclosed this information via a sustainability report and 4 via interactive maps, compared to 2 and 3, respectively, for start-up brands. Regarding *RQ#3*, only one incumbent brand used blockchain technology, and one start-up brand used tags/barcodes to record and validate the information.

Discussion and Conclusion

Although Agrawal and Pal (2019) suggested that brands disclose 19 aspects of traceability information, we found that, practically, brands only disclose supplier details, which does not ensure sustainability claims. Some selected start-ups (e.g., ASKET, All American Clothing Co) are pioneers in ensuring traceability for each product. ASKET allows consumers to trace the individual product history starting from tier 1 to tier 4. Moreover, All American Clothing Co. includes a “traceability number” with each pair of jeans, allowing customers to trace the suppliers all the way to cotton farmers. While these start-ups are fully transparent by allowing consumers to trace products from tier 1 to tier 4 suppliers, incumbent brand H&M is partially transparent, allowing consumers to trace individual products only to tier 1 suppliers. Disclosing

individual product-level information is critical for both brands and consumers as it enhances brand reputation. ASKET, All American Clothing Co., and H&M are leveraging this feature in their marketing campaigns. Other brands can gain insights from this practice. This study contributes to sustainable SC management and transparency literature by analyzing specific company cases. For future studies, the relationship between traceability implementation and company performance can be investigated.

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