Toward total traceability and full transparency communication in textile industry supply chain

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Abstract

The Textile and Clothing industry is facing systemic and global challenges due both to ecological and economic crises. Today, increasing full traceability of supply chain is one of the key points to optimize production but it should also serve to inform consumers to foster sustainable purchasing decision. We argue that the total traceability of the garment supply chain must be constructed to enable a full transparency for the consumer. In this paper, we will start analysing brands' trans-parency communication and describe the particular complexities of the textile supply chain.

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KeyWords: Traceability, Transparency, Textiles and Clothing, Fashion industry, Supply chain

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Introduction

The textile industry is facing two challenges an ecological and an economic crise.

Fast Fashion acceleration

Since the rise of fast fashion, textile industry is one of the major contributors to pollution and waste. More and more garments are being produced relying on cheap manufacturing, frequent consumption, and short-lived garment use. Fashion brands are now producing almost twice the amount of clothing today compared with before the year 2000 [10] . To achieve faster and cheaper production, production is outsourced, only a few brands have or retain their production facilities. Since the 1960s, manufacturing moved from Europe to the Middle East and to Asia[3]. Raw materials are produced in Asia. Whereas Design, Head-quarters, and Retail are still in the USA or Europe. These movements draw a generic map of the textile industry that is complex with a global supply chain. The various stakeholders are spread over several continents. All this stratified system creates a chain of interdependent companies [9] with multi-disciplinary actors: farms that grow fibres, petrochemical industries, facilities that make and dye yarns, others that knit or weave yarns into fabrics, others that print fabrics, tanneries that transform hide into leather, factories that cut, sew, assemble garments, logistics, retail [7].

Awareness-raising

This fragmented supply chain requires different laws and regulations [3]. All this complexity has come to light because of various dramas of our time: child labour, the Rana plaza disaster, the scandal of the Uighur cotton forced production, or the flooding of a clandestine textile workshop in February 2021 in Tangier that has claim twenty-eight lives. Companies can no longer ignore the origin and production conditions of their goods. They must be accountable internally, to their cus-tomers, to the environmental footprint, and in France, since 2017, are legally subject to the duty of vigilance. (LOI n° 2017-399 du 27 mars 2017) A directive at the EU level on this issue should be adopted based on these principles in 2021.

Recession and De-consumption perspective

In 2018, 44 percent of consumers bought less clothing and for 40 percent of them, it was a chosen de-consumption. Among them, more than a third of young people (18-25 years old) [1].This phe-nomenon reveals a growing consumer awareness and a growing distrust of the indus-try's companies. Furthermore, retailers are declining, not meeting customers' needs. Between

2008 and 2018 the textile and apparel industry lost 15 percent of its value in France [1]. This recession affects principally middle markets brands and women Ready to Wear (-18 percent to 20 percent) [1]. This phenomenon may be local before 2020, but because of COVID 19 pandemic recession, this trend may be generalized. A survey conducted in April 2020 across 2035 British and German consumers reveals that 64 percent of them would spend less on fashion during the crisis, and half of them expect that trend to continue after the crisis passes. As well, consumers are open to purchasing more durable fashion items, as well as repairing and keeping them longer [5]. This survey reveals a shift in purchasing behaviour. We argue that the textile industry must understand and support these new consumer behaviours by becoming more transparent about their products origin and means of fabrication. Inventory of full process data traceability is necessary to know, justify, analyse, improve, and communicate information. Firstly, we will review the current situation regarding the transparency of information communi-cated by brands. In the second part we will explain some of the specific supply chain complexities of the Textile and Garment industry.

1 Transparency: what brands communicate

There are legal requirements in Europe that impose a limited communication about the traceability of textile products. Labels on clothes must only describe composition. However, most brands print on their labels the country of manufacture: "made in", because it is mandatory in some countries where these clothes are sold (e.g. US or Japan).
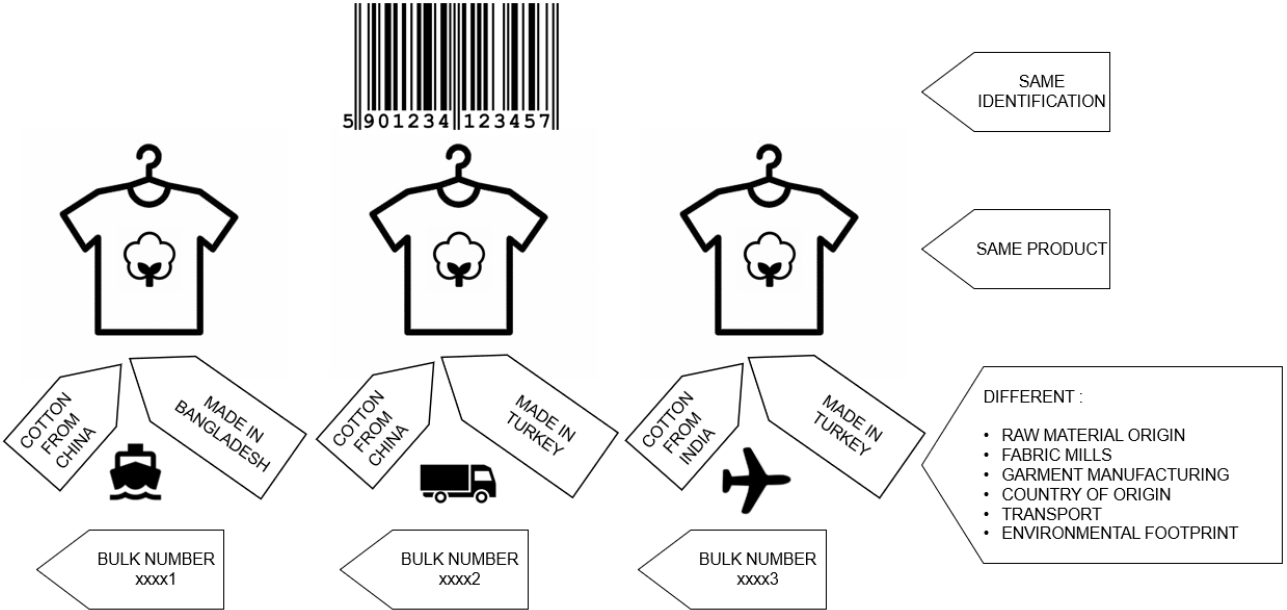

Figure 1. Example of retail information on similar T-shirts with different origins
These 3 t-shirts are similar and have the same identification (bar-code)

The Bulk number XXX1 t-shirt is made in Bangladesh from Chinese cotton, it was transported by boat.

The Bulk number XXX2 t-shirt is made in Turkey from Chinese cotton, it was transported by truck.

The Bulk number XXX3 t-shirt is made in Turkey from Indian cotton, it was transported by plane.

Figure 1 shows the difficulties for consumers to make informed purchasing decisions directly in-store with only the country of manufacture information available in most cases. The United Nations, through its 2030 agenda, defined 17 Sustainable Development Goals. Among those, goal 12 "Ensure sustainable consumption and production patterns" and target 12.8 identifies the need for "people everywhere to have the relevant information and awareness for sustainable development and lifestyles in harmony with nature" [11]. Since 2015, Fashion Revolution publishes an annual report of the Fashion Transparency Index [2]. In 2020 they reviewed 250 of the world's largest fashion brands and retailers and ranked them ac-cording to how much they disclosed about their social and environmental policies, practices, and impacts. Despite progress, most of them still lack transparency: the best brand tops at 73 percent and the average score is 23 percent. Researchers assess the 250 brands with publicly available infor-mation. And in a second time, brands have the opportunity to complete a questionnaire, those that participate typically receive higher scores as researchers may have missed relevant disclosure documents. But only 53 percent of brands are participating by returning and completing a questionnaire, which testifies to the relative commitment of brands. Mass-market brands revealed higher transparency of supply chain disclosures [2]. The consumer survey by Fashion Revolution in 2018 and 2020 suggests that fashion labels should be transparent with the disclosure of information to consumers: Manufacturer's address, the origin of fabric, and raw material. Some of this information is available on the label's website but on the product and point of sale, most of the time only the garment manufacturer country is available. Concerning future works, we are performing a study on what the Fashion Pact brands communicate in-store compared to what they communicate on their website. This study covers 55 brands among the 77 companies involved in the Fashion Pact, provided that they are distributed and accessible in France online and in-store. For groups, we have picked one brand to consider. We have excluded from our selection the companies involved in the Fashion Pact that are distributors, manufacturers or merchandising suppliers. More research needs to be done to compare the information available online and in-store. From our initial observations, we notice that the country of manufacture is present on the labels of the products in stores in most cases, and is the most accurate information available. On merchant sites, for the same product references, this information is less frequent. On the contrary, the most transparent brands can display the

name of their manufacturer as well as information about the manufacturing conditions on their website, and do not communicate this type of information in stores. As per Figure 1., "Made in" doesn't inform precisely about material origin, mill environmental footprint, transport.

2   Garment supply chain

The garment supply chain is a complex multi-actors buyer-driven production chain (figure 2). Re-tailers promote and sell apparel but rarely produce goods. Manufacturers have different functional capabilities, that involve different models of sourcing goods and therefore traceability for the buyer. However, we argue that from a consumer perspective these production models should have no impact on what information is provided regarding their product.
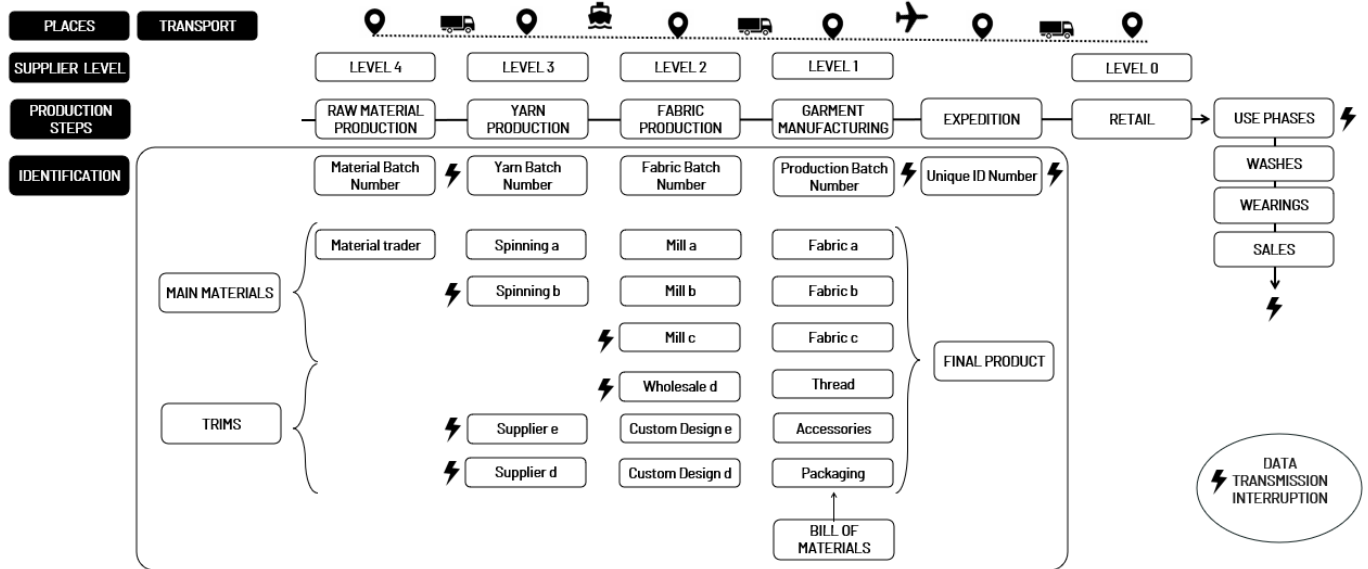

Figure 2. Generic product traceability process

Actors are grouped vertically by level from raw material production (Level 4) to sales (Level 0):

At Level 0 the brand orders production and is in charge of retail.

At Level 1 manufacturers cut, sew, and assemble garments.

At Level 2 factories transform yarn into fabric by weaving or knitting.

At Level 3 factories process raw materials into yarn. This level includes cleaning steps such as ginning cotton or washing wool and spinning mills.

At Level 4 manufacturers produce raw materials: e.g. farms grow fibers such as cotton or wool, petrochemical industries produce synthetic fibers, or recycled fibers. Production schemes Outsourced manufacturers at level 1 can propose 3 types of services [4].

Make and trim (CMT)

A Level 1 factory is paid a processing fee and uses fabric and trims sourced and owned by the Level 0. In this production scheme the brand retains the most information about its product origin, mate-rial and transformations. This is the ideal case for the full transparency as the brand is in full control of its supply chain.

Original Equipment Manufacturing (OEM)/ Package Contractor

According to brand (Level 0) specifications, quoted price and design, the manufacturer (Level 1) is capable of sourcing and financing fabric and trims from Level 2 factories of its choice, and providing all production services, finishing, and packaging for delivery to the retail outlet. In this case, the brand (Level 0) has a limited knowledge of the origin of goods and the Level 2, 3 and 4 actors involved in the processes.

Original Design Manufacturing (ODM)/Full Package

A full package garment supplier (Level 1), after agreeing on a quoted price with the brand (Level 0), organizes all steps involved in the production of a finished garment, including design, fabric pur-chasing, cutting, sewing, trimming, packaging, and distribution. As per OEM, the brand (level 0) has a limited knowledge of the origin of goods and the Level 2, 3 and 4. It has in addition a low control on the specifications of the product, for instance regarding materials or fabrication condi-tions. In a competitive industry, companies are reticent to divulge too much information about their sourcing, as it could undermine their competitive advantage. During the transformation process from raw material to garment, all steps involved in production could be traced as a traceable event to identify origin of components, their complete composition, their process, their social and environmental impacts.

Events and assets

Along the supply chain, the traceable assets are transformed many times: from raw material (fibers) to intermediate material (yarn or fabric) to finished product (garment). These traceable assets can be aggregated and disaggregated in batches corresponding to trade or logistic units. Following the Bill of Material for a garment, each component can be identified individually or from a batch of items. To identify or trace each item or batch of items uniquely in the supply chain, they could be tagged as a traceable resource unit (TRU) with technological help: RFID, QR code, Bar-code, Bulk number, Tag, Raw material marker [8]. Research from 2016 showed that only 7 percent of companies knew their cotton supplier [6] . Bales of cotton are mixed during the process, and one t-shirt could be composed of yarn coming from different cotton

suppliers. For Global Organic Textile (GOTS) certification, a fashion brand can claim that a t-shirt is made of certified organic origin cotton only if at least 95 percent of the fiber content of the product is certified. Traceability is essential to claim good practices because without proof, brands can be accused of greenwashing [8].

Conclusion

Information provided to the customer is sparse and accessibility is low. Online and in-store access remains different. It is difficult for consumers to make informed purchasing decisions directly in-store, without previous active research. Solutions to restitute data today include in-store: sales-person telling a product story and labeling on the product, but these media are not sufficient. Technology could help matching information published online and in-store. Connected touch screens could inform with precise data, adding what is available online to latest data collected e.g. about the environmental impact, taking into account the delivery to the store. Mobile applications including Blockchain technology can share a chronological chain of records of all supply chain transactions for a unique ID product. It can help for valuable goods to have proof of authenticity as a guarantee, but environmental cost can be important. As well, 3rd Part Mobile applications can describe brands' CSR policies but usually do not indicate product information according to a batch number or unique item. Brands become transparent, disclosing more traceability data than before. Prioritizing meaningful information can be difficult not to overload customers with information that would be unnecessary in making their purchase decision. Defining a standard list of data that can be collected and com-municated according to fashion brands and consumer profile is a challenge. Restitution of the data adapting to consumers' profiles is key, scoring may be necessary to create visible, focused, meaningful, and clear information.

Acknowledgments

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