‘FASHION RETAILERS WITHIN THE EUROPEAN LANDSCAPE OF POST-CONSUMER TEXTILE WASTE MANAGEMENT’
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WHERE ARE FASHION RETAILERS POSITIONED IN THE EUROPEAN LANDSCAPE OF POST-CONSUMER TEXTILE WASTE MANAGEMENT?

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4. All quotes from other sources are recognizable in the report by quotation marks and the sources of all my information have specifically been indicated.

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ABSTRACT

This research addresses the question: ‘Where are fashion retailers positioned in the European landscape of post-consumer textile waste management’. Adapting circular strategies to manage post-consumer textile waste is an emerging field for fashion retailers, that is rich of opportunities to generate additional revenue, lower their impact on the environment and develop closer relationships with their target audience. One barrier for retailers to adapt circular strategies is the lack of know-how and of best-practice examples.

In collaboration with Circle Economy (CE), a quantitative analysis of 170 sample organizations working in the landscape of post-consumer textile waste management throughout Europe is conducted. CE’s ‘7 Element’ framework is applied to analyze the circular strategies in operation. Focus is placed on fashion retailers in the context of the entire landscape, outlining current developments and gaps to specify future opportunities. The quantitative findings are supported by qualitative interviews with professionals of the industry as well as literature.

Findings include that countries with most activities in this field are Germany, The Netherlands, Spain and the UK. Although the landscape is largely made-up of many small and medium sized businesses (SMEs), big organizations are identified as most impactful. Fashion retailers tend to avoid post-consumer textile waste, by extending the life of their products. They lack to collaborate with stakeholders of the industry despite engaging into marketing dialogues with consumers. It is evident that fashion retailers are currently developing takeback programs of secondhand garments, however further integration of consumers is needed.

When looking at the remaining landscape despite retailers, a focus is placed on reuse and recycling. Therefore it is suggested that collaborations with other stakeholders of the landscape can help retailers to further manage their post-consumer textile waste. In addition shared investments into new recycling methods and recyclable materials forms an opportunity for the industry to move forward together. In order to enhance transparency and drive synergies throughout the post-consumer textile waste landscape, the adaptation of new digital tools is suggested. If these recommendations are adapted, this research report suggests a positive outlook for the industry.
1. INTRODUCTION

1. RATIONALE

The fashion industry is facing a turning point. It can follow its old linear ways to ‘produce-consume-dispose’ or the opportunity to pursue profit and sustainable growth through adapting a circular system (GFA, 2017). Placed at the center of this choice are fashion retailers, who control supply chains and manipulate market demands through marketing strategies (Hvass, 2014). Until now, the majority of fashion brands drive profits by shortening the life-cycles of their products, decreasing the quality and promoting a disposal mindset towards consumers (Lewis et al., 2016). This behavior has lead to severe environmental pollution caused by so called ‘post-consumer textile waste’. Currently less than 1% of produced garments are recycled back into new garments (Ellen MacArthur, 2017).

It is estimated that by 2030, the global population rises to 8.5 billion people (United Nations, 2015), which entails an extreme growth of apparel consumption from current 52 million tons to projected 102 million tons annually (GFA, 2017 & Ellen MacArthur, 2017). Therefore, addressing mass-pollution caused by textile waste is of growing urgency. Practicing post-retail responsibility, which is when retailers integrate the management of post-consumer products into their business model, is an emerging field as retailers begin to adapt circular strategies (Hvass, 2014). This field is rich with opportunities of indirect and indirect benefits for retailers, for example additional revenue streams, enhancement of customer loyalty as well as environmental savings (Interview with Cunningham, CE, 2018).

Realizing the potential captured in post-consumer textile waste requires a reinvention of the existing value propositions and a holistic involvement of stakeholders (Hvass, 2014). If globally, fashion retailers would recollect their post-consumer textiles and recycling them back into higher value fibers, the economic benefit for the world's economy is projected to be more than 80 billion Euro in 2030 (GFA, 2017 & Ellen MacArthur, 2017). However, since it is an emerging field, there is a lack of best-practice examples and of information sharing throughout the industry.

2. AIM

The outcome of this research outlines the European landscape of post-consumer textile waste management by analyzing all types of organizations that are part of this landscape. For each organization the characteristics and circular activities are analyzed. Fashion retailers are researched in more detail and set in relation to the remaining landscape in order to outline gaps and opportunities.

The main goal of this research is to support the emerging field of textile circularity by facilitating knowledge sharing along stakeholders of the industry and by promoting the concept ‘circular economy’ further. This is done by 1) providing a list of best-practice examples for the field of sustainable fashion business models, 2) providing a long list of companies suggested for
possible partnerships for retailers who want to adapt circular strategies and 3) providing a comprehensive status report as a basis for further academic research. The collaboration with CE, gives this research additional practical application. The collected data of organizations is going to be published on the ‘Circle Fashion Tool - Knowledge Hub’. This library serves as an inspirational repository for all organizations, academics and students interested in this field.

3. QUESTIONS
To further shed light into the field, this research has the goal to answer the main question: ‘WHERE ARE FASHION RETAILERS POSITIONED IN THE EUROPEAN LANDSCAPE OF POST-CONSUMER TEXTILE MANAGEMENT?’. In order to do so, three sub-questions are addressed:

(Q1) WHAT DOES THE LANDSCAPE OF EXISTING ORGANISATIONS PRACTICING POST-CONSUMER TEXTILE WASTE MANAGEMENT ACROSS EUROPE CURRENTLY LOOK LIKE?

(Q2) WHICH TYPE OF CIRCULAR STRATEGIES ARE MOST COMMONLY USED BY FASHION RETAILERS?

(Q3) WHAT IS THE RELATION BETWEEN FASHION RETAILERS AND OTHER MEMBERS OF THE LANDSCAPE?

4. METHODOLOGY
The research addresses these questions by building and analyzing a database of sample organizations that practice different post-consumer textile waste management strategies in Europe. In addition, these quantitative findings are validated with qualitative expert interviews and literature.

The samples are catalogued in an excel sheet, including specific information regarding each organization. To group the circular-strategies of each organization in a manner that allows pivot table analysis the ‘7 Element’ framework developed by Circle Economy is adapted. Explained in more detail throughout the methodology section, the framework identifies seven categories of circular strategy approaches. The advantage of this framework is that for each of these seven categories, called elements, a set of textile-/fashion-specific strategies and sub-strategies are defined, to describe how the organizations operate circularity. The collected data is analyzed using pivot tables to address the questions of this research. It is the overall goal to outline the landscape with all types of organizations and to understand where fashion retailers are within this landscape in order to forward context related recommendations. The term landscape is used to describe the field ‘post-consumer textile management’ with all of its different members, ranging from for example companies and research institutes to NGOs.

5. STRUCTURE
The ‘7 Element’ framework is reviewed together with existing literature throughout ‘the 7 Elements of circularity’ chapter. The chapter ‘methodology’ describes how the data is collected.
and analyzed. ‘Research and analysis’ addresses the three sub-questions by outlining the primary research of this report including the database analysis and interviews. Finally, ‘conclusions’ summarizes the results and addresses the main question of this research: outlining fashion retailers within the landscape of post-consumer textile waste management.

6. LIMITATIONS
The results of this research should be evaluated by taking a number of limitations into account: First, the research is based on the ‘7 Element’ framework, however minor deficiencies are identified when comparing the framework to existing literature. Second, the research is limited to 12 central European countries. Third, results are impacted by the fact that the author’s language skills are limited to German and English. Moreover, the level of exposure that organizations receive online impacts the results of the database analysis. Especially results such as ‘readiness level’ should be carefully considered, as companies who are advanced in their operations or are especially skilled in marketing can experience more exposure than organizations that are informal or still in ideation or piloting phase.
2. THE ‘7 ELEMENTS’ OF CIRCULAR STRATEGIES

The ‘7 Elements’, is a framework developed by CE as a mean to overcome the lack of common language in this field. The integrated framework allows standardized categorization of existing operations that are part of creating a circular textiles economy (Interview with Cunningham, CE, 2018). Its strong applicability to the fashion industry and its holistic approach to business modeling makes it most suitable for the analysis of primary data of this research. In the following, each element is described and validated with existing literature. Minor deficiencies are uncovered and highlighted in the following such as the lack to mention ‘emissions’ or ‘consumer education’. The framework considers the following overarching circular strategies:

1. PRIORITIZE REGENERATIVE RESOURCES
This element describes the efficient management of materials, water and energy throughout the manufacturing process. The Textile Exchange’s life-cycle assessment estimates that replacing conventional cotton with organic cotton could cut energy consumption by half throughout production (Berlepsch et al., 2018 & Luttropp and Brohammer, 2014). It should be noted that the first element is limited, as it does not take greenhouse gas emissions into account.

2. PRESERVE AND EXTEND WHAT’S ALREADY MADE
Preservative strategies maximize the lifetime of products in and after use, through for example maintenance, repair and secondhand trade. In the past 15 years, the utilization rate, the times a garment is used, decreased by almost 40% and half of the produced garments are disposed
within a year (Ellen MacArthur, 2017). Other studies also support reuse, repair and part recovery as relevant circular strategies, supporting the validity of the second element (Lewis et al., 2017 & Hvass, 2014 & Nussholz, 2017 & Brooks, 2015 & Rivoli, 2009).

3. USE WASTE AS A RESOURCE

This element refers to recovering secondary resources through open and closed loop reuse practices as well as recovering energy from textile waste. Several studies outline the opportunities of material recycling (Nussholz, 2017 & Lewis et al., 2017 & Burkhari et al., 2018). For example, if by 2030 all fibers were recycled into new clothing, the value for the world’s economy could be up to 80 billion Euro (GFA, 2018).

4. DESIGN FOR THE FUTURE

‘Design for the future’ refers to managing post-consumer waste at the design stage, by designing for minimal waste, recyclability and durability for example. Other academic literature supports this, outlining design for the future strategies including deconstruction and material compositions suitable for recycling (Lewis et al., 2017 & Luttropp, Brohammer, 2014 & Rivoli, 2009). Brands are urged to train their product developers in regards to adapting circular strategies at the design stage (GFA 2017 & ECAP, 2015).

5. COLLABORATE TO CREATE JOINT VALUE

This element refers to the collaboration with industry members, consumers, governments or communities through trainings, dialogues or shared projects. Collaborations are key when adapting circular strategies as they allow sharing of knowledge, skills and resources (Hvass, 2014 & Burkhari et al., 2018 & Nussholz, 2018). In its specification this element lacks to include practices such as ‘reducing new demand’ and ‘educating consumers’, which this research includes in the fifth element.

6. RETHINK THE BUSINESS MODEL

Organizations rethink their practices with strategies that reinvent the product or service proposition. Examples include business models that offer subscription and rental services or exchangeable parts for products (Hvass, 2014).

7. INCORPORATE DIGITAL TECHNOLOGY

This element describes activities that are based on digital data insights and online platforms. Technological tools enable closer collaborations and form an essential part of transitioning into the circular economy (Hvass, 2014 & Lewis et al., 2017). Digital tools should be developed to enable transparency throughout the supply chain to initiate an efficient life-cycle management of natural resources for example (Lewis et al., 2017).
3. METHODOLOGY

To address the research questions, a database of organizations, which operate post-consumer textile waste management strategies, is developed. In the following the technique applied to build and analyze the database is explained.

1. RESEARCH | BUILDING-UP THE DATABASE

In order to ensure that the results of the different countries can be compared, each country is researched for 2 days (8hrs/ day), set between the 15th of March and the 15th of April 2018. The scope of the database includes a total of 170 organizations from 12 central European countries. The countries included in the database are selected based on the ‘CE-priority rating’, which prioritizes countries with the biggest track record of circular-strategies (Interview with Cunningham, CE, 2018).

The research techniques applied to aggregate the cases include 1) interviewing colleagues at CE for known cases (Interview with Cunningham, Smiths, Siron and Roade, 2018), 2) explorative research on the internet using ‘7 Elements’ – related keywords and 3) scanning the reference lists of industry reports and associations (e.g. Pulse of the Fashion Industry, 2018 & Nordic Council of Ministers, 2017).

In order to later publish the cases on the Circle Lab, the database first uses an excel sheet provided by CE, that is able to synchronize with the Circle Lab website. As the second step, to allow pivot table analysis, the database is separated into two excel sheets: 1) ‘Database – Organization Overview’ maps out existing organizations and their characteristics, 2) Database – Strategy Overview’ categorizes the different organizations dependent on which of the ‘7 Elements’ is adapted.

2. ANALYSIS | ANALYZING THE DATABASE

<table>
<thead>
<tr>
<th>COLUMN</th>
<th>DEFINITION</th>
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<tbody>
<tr>
<td>Organization</td>
<td>name of the organization</td>
</tr>
<tr>
<td>Size</td>
<td>size of the organization, scoring logic is applied according to the number of employees: Multi national sized (&lt;4500), Corporate sized (&lt;1500), Medium-sized (&lt;250), Small (&lt;50), Micro (&lt;10), Start-up (&gt;10). NGOs are categorized based on their area of operations (local, national, international).</td>
</tr>
<tr>
<td>Market Segment</td>
<td>market area in which the organization operates (e.g. luxury, fast-fashion etc.).</td>
</tr>
<tr>
<td>Description of Activity</td>
<td>brief description of the organizations and their business models.</td>
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</table>
Revenue Logic describes how the organization generates revenue, including: retail, wholesale advertising & PR and service provider.

Readiness Level categorizes the maturity stage of the organization, including: idea (proposal, looking for funding), pilot (funding secured, small-scale pilot launched, test phase) or production (circular strategy is implemented and operated as part of daily business).

(Q1) WHAT DOES THE LANDSCAPE OF EXISTING ORGANISATIONS PRACTICING POST-CONSUMER TEXTILE WASTE MANAGEMENT ACROSS EUROPE CURRENTLY LOOK LIKE?

The first question is addressed by analyzing the ‘Database - Organization Overview’, using pivot table analysis. The distribution of organizations along the different categories is identified, to outline the landscape of post-consumer waste management throughout Europe.

(Q2) WHICH TYPE OF CIRCULAR STRATEGIES ARE MOST COMMONLY USED BY FASHION RETAILERS?

This question is addressed with the second excel sheet ‘Database- Strategy Overview’, specifying which of the ‘7 Elements’ are in operation for each organization. In addition the respective strategies and sub-strategies are outlined. The results are ranked based on their popularity. In continuation, the findings are further put into context with interviews and literature.

(Q3) WHAT IS THE RELATION BETWEEN RETAILERS AND OTHER MEMBERS OF THE LANDSCAPE?

Based again on the second excel sheet, the activities of retailers are put in relation to the activities of the other members of this landscape. Finally, gaps and opportunities for retailers in relation to the remaining landscape are outlined. The findings are again further validated by connecting them to interviews conducted with professionals from the industry as well as literature.
4. RESEARCH & ANALYSIS

(Q1) WHAT DOES THE LANDSCAPE OF EXISTING ORGANIZATIONS PRACTICING POST-CONSUMER TEXTILE WASTE MANAGEMENT ACROSS EU EUROPE CURRENTLY LOOK LIKE?

The current landscape of post-consumer waste management in Europe is characterized by the (1) readiness level, (2) organizations per county, (3) size of organizations and (4) revenue logic.

Analyzing the readiness level of the current post-consumer textile waste management landscape shows that 85% of organizations are in the production stage. 13% of organizations are in the piloting stage and 3% are still in the ideation stage (Fig. 4.1.1.). These findings indicate that the majority of the post-consumer textile waste management landscape is already in the mature stage of their evolution, with circular strategies already having passed the testing and implementation phase.

Figure 4.1.1.: Distribution of organizations per readiness level, in analyzed database

Most post-consumer waste management activities are found in Germany, the Netherlands, Spain, the UK and France (Fig. 4.1.2). The least activities are found in Belgium, Denmark and Sweden. The distribution appears to correlate with the value invested in clothing per household (Statista, 2015) and the consumption of clothing per country in kilo (European Commission, 2017). The larger the investment and consumption, the more post-consumer textile waste activities are taking place in a country. As textile waste becomes of growing concern with
increasing consumption, these countries welcome organizations, which practice circular strategies (Weiguny, 2018). Another influence is the local culture: Germany, for example, has a long-standing history of recycling, making it more open-minded towards circular practices (Interview with Cunningham, CE, 2018).

Looking at the size of organizations active in post-consumer textile waste management, 79% are SMEs. These include micro, unidentified (N/A), national NGOs, small and medium-sized organizations. (N/A) graded organizations are included as SMEs as it can be assumed that smaller sized organizations are unlikely to publish their size. These are followed by large organizations (MNEs), which make up 15% of the observed data, including corporate, multi-national NGOs and multi-national sized enterprises. The smallest observed category, are research institutes, local NGOs and start-ups that account for 6% of the data set (Figure 4.1.3.)

Although SMEs make up the majority of the current landscape, MNEs are identified as the driving force of post-consumer waste management. As large organizations assert their market dominance in the fashion industry, their adaptation of circular strategies has a larger overall impact (Interview with Cunningham, Circle Economy, 2018). This notion is supported by the ‘Pulse of the Fashion Industry’ report, where larger corporations in general gained a higher sustainability score (GFA, 2017).

When analyzing the business models, which these organizations deploy, 33% of organizations base their revenue streams on providing a service and 29% are working with a retail business model. Advertising & PR and Wholesale organizations each account for 19% (Fig. 4.1.4.).

Retailers, however, may form the most crucial drivers of post-consumer textile waste management due to their position as consumer-facing organizations, which sell the actual products. The findings show that apparel retailers already account for over a quarter of
organizations partaking in post-consumer textile management. This further outlines the relevance to understand retailers within the landscape of post-consumer waste management.

![Figure 4.1.3: Distribution of organizations per size, in analyzed database](image1)

![Figure 4.1.4: Distribution of organization revenue logic, in analyzed database](image2)

**Q2) WHICH TYPE OF CIRCULAR STRATEGIES ARE MOST COMMONLY USED BY FASHION RETAILERS?**

The analysis shows that out of the entire database of 170 cases, 49 organizations are fashion retailers. Retailers mainly operate strategies that aim to avoid post-consumer textile waste through design and efficient material usage. The most popular tactics deployed by these organizations are (1) design for the future, (2) preserve and extend what’s already made and (3) collaborate to create joint value (Fig. 4.2.1.)

Retailers realize ‘design for the future’, through designing physically durable products and products suitable for recycling. The most popular practices focus on using biodegradable and recyclable materials. For example, C&A developed a ‘C2C Gold CertifiedTM’ t-shirt that can be safely composted at the end of its use (C&A, 2017) and Jan N’ June use recycled polyester that is suitable to be recycled again (Jan N’ June, 2018). However, strategies, which directly involve consumers such as design for modularity or emotional attachment, are barely applied.

The second element, which is used by retailers, is ‘preserve and extend what’s already being made’. Practiced by maximizing the lifetime of products in- and after-use through refurbishment
and repair. Its usage shows that retailers focus on avoiding post-consumer waste and begin to give garments a longer life. Examples include Hanwag (Hanwag, 2018), who educates on product maintenance or Kings of Indigo, who offers repair kits (Kings Of Indigo, 2018). The same time, it is evident that there is little initiative by retailers to recover parts or build an own brand second hand store.

‘Collaborate to create joint value’ is mainly practiced through the strategy ‘customer/ consumer collaboration’. At first sight this indicates that retailers are closely working together with their customers to enhance their post-consumer waste practices, however this is not the case. Retailers mainly collaborate with their customers in terms of marketing dialogues. Other customer collaboration strategies such as customization and co-creation are barely used. This puts forward the notion that retailers don’t truly integrate consumers into post-consumer textile waste management practices. On the other hand, takeback programs are becoming more popular, with 8 out of 59 retailers operating such a program as for example FilippaK (FilippaK, 2018). However, retailers in general barely collaborate with other members of the landscape, this opens-up the question how the collected products are repurposed.

The remainder of the 7 elements has proven to be less popular with retailers, albeit still being used by some. Retailers who ‘use waste as a resource’ largely focus on open loop practices by integrating recycled contents into their collections. For ‘Prioritizing regenerative resources’ an almost singular focus is put on regenerative materials. Other resource efficiency strategies regarding energy and water are hardly applied. ‘Rethink the business model’, where retailers focus on implementing leasing or rental services is the second least popular element. The least applied element is ‘incorporate digital technology’, with only two retailers developing online platforms to manage post-consumer textile waste.

Overall, the findings suggest a scattered approach with no one-fit starting point. In general, retailers prefer strategies that prevent post-consumer textile waste instead of repurposing it. Preventive strategies include ‘design for the future’, ‘preserve what’s already made’ and ‘prioritizing regenerative resources’.

Retail is the only business model directly in touch with all stakeholders of the value chain, in particular consumers. The analysis shows that this positioning is not fully leveraged as industry collaboration, for instance, is barely practiced and consumer collaboration is limited. Fashion retailers mainly collaborate with consumers through marketing dialogue instead of letting them partake in product creation for example. However, there is a growing tendency that takeback programs are becoming more widely adapted which will require more industry collaboration in the future in order to repurpose the collected items. Interviews with industry professionals show that these collaborations are already in the pipeline. Fashion retailers increasingly build partnerships with charities and secondhand garment traders to reuse and recycle their own brand secondhand ware (Interview with Zurkova, RREUSE, 2018 & Needham-Reid, Oxfam UK, 2018 & Ahlmann, FAIRWertung, 2018 & Cunningham, CE, 2018). This also aligns with the finding that 79% of post-consumer textile waste organizations are SMEs because secondhand
garment traders are usually small family-owned businesses (Interview with Cunningham, CE, 2018 & Rivoli, 2009).

If retailers continue to increase their industry collaboration further, the use of other important circular strategies such as part recovery, design for disassembly and closed loop recycling can be further adapted. This supports the notion that retailers should collaborate more. Finally, the fact that digital technology is barely applied, implies a lack of transparency and information sharing between fashion brands and all of their stakeholders. Previous research supports this notion: connecting stakeholders through digital platforms and increasing transparency throughout the supply chain are key development points for the circular fashion industry (Burkhari et al., 2018 & Brooks, 2015).

![Figure 4.2.1.: Distribution of 7-Elements and strategies along retailers (top= most commonly applied, bottom = least commonly applied).](image)

**(Q3) WHAT IS THE RELATION BETWEEN FASHION RETAILERS AND OTHER MEMBERS OF THE LANDSCAPE?**

The following section evaluates the ranking of circular elements practiced by the remaining landscape, including wholesale, advertising & PR as well as service providers (Fig. 4.3.1.). The findings are used to relate retailers to the context of the entire post-consumer textile waste management landscape.
Out of the 170 cases analyzed, besides fashion retailers 121 account for the remaining landscape, which operate a total of 236 strategies. With an average of 1.9 strategies, other members deploy fewer strategies compared to the average of 3.2 strategies of fashion retailers.

The element ‘Collaborate to create joint value’ is most widely adapted along the remaining landscape, focusing on industry and consumer collaborations through guidance, dialogue and marketing. Next, ‘Preserve and extend what’s already made’, is widely adapted through the trade of secondhand goods. Third, waste is used as a resource through open loop and closed loop recycling including chemical and mechanical recycling methods. Fourth, ‘incorporate digital technology’ focuses on the development of online platforms and marketplaces. ‘Design for the future’ is on fifth place, almost entirely based on designing for cyclability through biodegradability. Second last, same as with retailers, is the element ‘rethink the business model’ mainly including service focused business models, offering subscription or crowd-related services. The bottom line is formed by the element ‘prioritize regenerative resources’ whereas alternative biobased materials and inputs are most commonly applied.

![Figure 4.3.1.: Distribution of 7-Elements and strategies along the sample, excluding retailers (top= most commonly adapted, bottom = least commonly adapted).](image-url)

When putting fashion retailers in relation to all players within the post-consumer textile waste management landscape the following observations are made.
Fashion retailers tend to focus on strategies that avoid or delay post-consumer waste such as offering repair services or focusing on the durability of products, whilst there is also a growing notion to recollect post-consumer waste. Other members of the landscape focus on strategies that relate to repurposing post-consumer textile waste such as secondhand trade or textile recycling. Working closer together with other members of the industry would, therefore, form a promising opportunity for retailers to further integrate post-consumer waste management into their business models. The interviews uncovered that such collaborations are already in the pipeline. Programs such as the ‘European Clothing Action Plan’ or GFAs ‘2020 Circular Fashion System Commitment’, additionally motivate fashion retailers to publicly commit to garment reuse targets (ECAP, 2015 & GFA, 2017). However, these fail to take the volume capacities of charities, secondhand traders and recyclers into account (Interviews with Cunningham, CE, 2018 & Dechent, Caritas, 2018).

Furthermore, only retailers naturally have direct contact to consumers and one of their strong suits is to market and advertise towards them. This unique positioning gives brands the opportunity to work closer with consumers in order to raise awareness and drive takeback programs. By 2030 resources will be significantly scarcer and the prices of virgin materials are set to increase and fluctuate (GFA, 2018). As the other members of the industry are further advanced in open and closed loop recycling practices, here collaborations can work towards enhancing textile-to-textile recycling. Shared R&D efforts and investments in post-consumer textile-to-textile recycling hold the opportunity for the industry to move forward together (Burkahari et al., 2018 & Ellen MacArthur, 2017).

Thirdly, all organizations depend on conventional natural and biodegradable materials, which require unsustainably high energy and water consumption in production. The data shows that little efforts are made in the areas of water and energy efficiency. Strengthening partnerships cross-industry should focus on combined efforts to develop new materials and products with decreased environmental impact throughout their lifecycle. For example QMILK developed a natural material made of old milk, which is biodegradable and reduces the footprint, as it does not need much water throughout production (QMILK, 2017).

As last point, other members of the landscape also take more advantage of digital technologies than retailers. Through further developing digital platforms and tools, collaboration and knowledge sharing across industry stakeholders will be enabled. As a result transparency and synergies can be enhanced and post-consumer waste management becomes more effective (Burkhari et al., 2018 & Brooks, 2015). An example includes ‘A Transparent Company’, who promotes the adaptation of blockchain technology to enable a seamless flow of information along all stakeholders of the fashion supply chain (A Transparent Company, 2018).

This research outlines gaps in some areas, which form great future opportunities, yet to be taken advantage of by fashion retailers. While retailers avoid or delay post-consumer textile waste, other members of the landscape repurpose it. By further developing takeback programs with consumers, garments can be diverted from landfills and can be reused. Collaborations on this front are already growing, but capacity issues of recyclers and secondhand traders need to
be taken into account. Further collaboration in cross industry R&D projects is required to develop new materials suitable for textile-to-textile recycling. This will ensure stable business practices as it cuts the dependency of retailers on virgin materials, which are subject to rising and fluctuating prices. The further development and adaptation of digital technologies can drive information sharing and transparency, throughout all stakeholders of the industry. Technology can enable a holistic approach towards repurposing post-consumer textile waste and transforming the industry into circularity.
6. CONCLUSIONS

The European landscape of post-consumer textile waste management practices, currently maintains Germany, the Netherlands and Spain as the leading countries. The landscape consists to 79% of SMEs, however, MNEs are identified as most impactful. Out of the analyzed organizations, 29% account for retailers, which makes them the second largest group besides service providers, wholesalers and PR organizations.

In continuation, it is established that fashion retailers maintain a scattered approach towards adapting circular strategies. It is evident that they practice a variety of different strategies at the same time and that there is no general starting point. Overall a focus on avoiding post-consumer waste is evident, by opting for repair services, design for biodegradability or physical durability. This may be a positive notion but does not address the fundamental waste issue that results from fashion retailing (GFA & BCG, 2017). Previous research highlights that fashion brands drive mass consumption through short life-cycles (Ellen MacArthur, 2017). However, this research shows a positive development, as brands begin to adapt strategies to extend the life of their garments through better qualities and durability.

Collaborating for joint value is the third most used element by retailers. However, when taking a closer look, it is evident that retailers barely collaborate with stakeholders of the industry besides consumer marketing dialogues. This hints that the main intention is to market circularity to consumers in order to enhance customer loyalty. Still, there are some good intentions behind the marketing activities as well, as indicated by the emerging trend to initiate takeback programs. However, other activities that would involve consumers further are not made use of. Elements that were not largely adapted by retailers include rethinking the business models and adapting digital technologies. This suggests that fashion retailers begin with minor changes such as adding recycled content to their collections or improving the quality but are not yet fundamentally adjusting their business models to circularity.

The circular strategy analysis of retailers displays a number of gaps, such as (1) retailers notion to avoid post-consumer waste, instead of finding solutions to recycle it, (2) their lack to collaborate with stakeholders of their value chain and (3) to develop digital tools to further drive post-consumer waste management practices.

When putting these findings into relation to other members of the post-consumer textile waste management landscape, a number of opportunities are uncovered. (1) the remaining organizations are particularly active in areas such as reuse and recycling of old garments. Partnerships here can help retailers to reuse their post-consumer items. By collaborating with other members of the industry, shared R&D investments can develop new and efficient recycling techniques and materials. As a result the upcoming collaborations can overcome recycling capacity issues whilst the overall footprint is reduced through less resource intensive
materials. The integration of new digital tools can furthermore drive transparency and collaboration throughout the industry, strengthening partnerships.

In conclusion, this research highlights a positive outlook: the European landscape, with all its players offers a good foundation to further build circular fashion business models, with many initiatives and solution providers already being present. As a result the impact of the industry on the environment is projected to improve and retailers are set to realize the value of 80 billion Euro that is captured in repurposing post-consumer textile waste in 2030.

Future research should be conducted into the direction to what extent the findings of this report are subject to its limitations by analyzing a larger dataset, collected from a number of country natives to avoid filter bubbles caused by algorithms online. This could be done through a collective approach by organizing multi-national ‘hackathons’ or ‘thinktank’ events. Future research should focus also on analyzing best-practice examples, to further describe how retailers can successfully collaborate with other members of the post-consumer textile waste management landscape. Finally, more qualitative research is needed to understand the impact of policy and action plans and how they can be developed to further support the landscape. For example it should be analyzed how the ‘European Clothing Action Plan’ or ‘GFA Commitment’ impact post-consumer waste management practices in Europe.
7. SOURCES


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